WHAT TO DO

IN

CASES OF POISONING

MURRELL

NINTH EDITION

C R MacDonald
1900

C. R. MACDONALD,
REVELSTOKE, B. C.

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BY

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PREFACE.

THE first edition of this book was published in 1881. Since then the treatment of disease and incidentally the treatment of cases of poisoning has made great progress. The eighth edition having been exhausted in a little over two years the duty devolves on me of preparing the ninth. The work has been thoroughly overhauled and is now as free from printers' errors as a work of this technical nature can ever hope to be. Medical men are often called on to give evidence in Courts of Law and in an Appendix I have given an abstract of the Oaths Act of 1888 (51 and 52 Vic. c. 46) as a reminder that they can no longer be compelled to run the risk of contracting disease by being made to "kiss the book."

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17 Welbeck Street, Cavendish Square,
London, W.

November, 1900.

WHAT TO DO

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CASES OF POISONING.

INTRODUCTION.

If sent for to a case of poisoning go at once—the patient's life may depend on your prompt attendance. If at night, do not stop to dress—scanty attire is permissible on these occasions.

Take your Antidote Bag or Case with you. If you have neglected to provide yourself with one, lose as little time as possible in hunting about for what you want. Do not go without a stomach-tube, and remember that you will require your hypodermic syringe, and very likely a solution of atropine. Your knowledge of the treatment of cases of poisoning may be excellent, but if you are without the requisite appliances you are of no use.

Enquire of the messenger what is the matter. His information will probably be unreliable, but you may get a hint that will enable you to decide at once on a plan of action.

Go straight to your patient and do not waste time in talking to the friends.

Make your diagnosis as quickly as you can, and commence treatment at once. If in doubt you will probably not be far wrong in giving a hypodermic injection of apomorphine or some other good emetic.

Order at once everything you are likely to require and send for anything you may have forgotten, so that there may be as little delay as possible.

If the room is full of people get rid of them or they will hamper your movements. Do not try to turn them out or they will make a scene and add to your troubles, but give them something to do—tell them to go and make coffee for example.

If you notice vomited matter, put it in a cupboard or other safe place when you have time; it may be wanted. Take charge of any bottles that may be about, even if they are empty.

Time is of the utmost importance, but try

and avoid all appearance of hurry and give your orders quietly and calmly.

Never regard a case as hopeless. In every case if you see the patient early and have the requisite appliances at hand there is a good chance of recovery. In children and those enfeebled by disease the prognosis is not so good. When the drug has been taken hypodermically it is an awkward complication.

Do not relax your endeavours because at first your efforts are unavailing. You may have to work away for three or four hours before there is much improvement.

Should you have a consultation? This is a difficult question to answer, so much depends on the particular circumstances of the case. If you are quite sure of yourself and know you can pull your patient through, the fewer people you have the better; but if the issue is doubtful it is a great help to have a friend who will not only give you the benefit of his advice but share the responsibility. You cannot pay a man a greater compliment than to call him in in consultation in a case like this. Often enough it is not only the patient's life, but the family reputation which is at stake.

Do not leave your patient alone even when

he has apparently recovered. Often enough as the circulation improves the symptoms reappear, probably from reabsorption of the poison. When there is a suicidal tendency there may be a renewed attempt in some other form.

Be sure of your diagnosis. Some time ago I was called in to see a young lady who was said to have attempted suicide—it was a love affair—with laudanum. I applied the stomach-pump without a moment's delay and then enquired how much she had taken. They said "a large quantity—two doses," so I used the stomach-pump again. I could not detect any smell of laudanum, so I asked how much she had taken altogether, when I found to my disgust that it was only six drops! I gave a favourable prognosis and went home.

Be cautious in giving a diagnosis, especially if you yourself are not very sure what is the matter, and be still more cautious in giving a prognosis. It is not a wise thing to endeavour to calm the friends by telling them there is "no danger," or that he "will be all right soon," for you may prove a false prophet, and they will not readily forgive you.

When you get home jot down a few notes

of what happened, noting especially time, doses, &c. The circumstances are fresh in your memory, and if you fail to take this precaution you will find to your cost how quickly things are forgotten.

It is possible that you may experience a difficulty in remembering the antidotes to the various poisons. If so, rest assured that your knowledge of pharmacology is defective. All rational treatment of cases of poisoning is founded on a correct appreciation of the physiological action of drugs.

THE DIAGNOSIS OF CASES OF POISONING.

THERE are grounds for suspecting that a person has been poisoned when:—

1. The symptoms come on suddenly and in the midst of apparent health.
2. The symptoms are observed immediately after a meal or after taking food or drink or medicine.
3. Several people who have partaken of the same article are simultaneously seized with similar symptoms.

The circumstances affecting or modifying the action of a poison are :—

1. Tolerance or Habit.
2. Idiosyncrasy.
3. Age and condition of health.
4. Form of administration and mode of introduction into the system.

How can you tell from what poison the patient is suffering? Sometimes nothing is more easy, whilst at others it is extremely difficult to arrive at a correct conclusion. A search for the bottle which contained the poison, or an enquiry of the nearest chemist may help you, whilst a knowledge of the sufferer's habits and disposition may prove of some assistance. The diagnosis is not always so easy as it looks at first sight. For example, you are called in to a patient who is evidently suffering from the effects of some narcotic poison, and on a table close at hand you find a hypodermic syringe, and a bottle of morphine: you conclude at once that it is a case of morphine poisoning, but you may be wrong. The patient had intended to kill himself that way, but dreading the trifling pain of the puncture, or not being expert in the use of the syringe, changed his mind at the last

moment, took 300 grains of chloral and threw the bottle under the grate. (For hint as to mode in which death by suicide may be made to simulate death from natural causes see death of Gammon, in Warren's "Ten Thousand a Year.")

Do not forget the possibility of a number of poisons having been taken together In one case a patient adopted a curious combination —a packet of Battle's Vermin Killer, two drachms of laudanum, and then half a drachm of red precipitate.

It is astonishing what a fashion there is in poisons for suicidal purposes. A few years ago people were satisfied with such ordinary domestic poisons as sugar of lead and oxalic acid, but nowadays they are hardly ever met with, and the rage is for the new synthetical compounds such as Phenyl-dimethyl-parazolone. It is necessary to exercise a certain amount of discretion in these matters. A friend of mine—it was a love affair—tried to commit suicide by taking a corn-solvent. It did him no harm but he had to leave the country. Reconciliation after such an exhibition of incompetence was out of the question.

It is a good plan to make yourself ac-

quainted with the composition of those patent medicines which possess active properties. There is no royal road to diagnosis, and the only way to arrive at a correct conclusion is to utilize your knowledge of the pharmacological action of drugs. The following lists may be of some use, but no attempt has been made to render them complete, and they must be taken as being merely suggestive.—

I. **You find the Patient Dead.**

1. PRUSSIC ACID. Death in a few minutes at the outside.
2. CYANIDE OF POTASSIUM. Usually kills very quickly.
3. STRONG AMMONIA. May kill in a few minutes.
4. CARBONIC ACID GAS. If pure may kill almost at once.
5. CARBONIC OXIDE.
6. OXALIC ACID.

Almost any active poison if given in a very large dose.

II. **The Patient is Comatose.**

1. OPIUM; MORPHINE.
2. ALCOHOL.
3. CHLORAL.
4. CHLOROFORM.
5. CAMPHOR.

III. **The Patient is Collapsed.**

STRONG ACIDS; ALKALIES; ACONITE; ANTIMONY; ARSENIC; TOBACCO; LOBELIA; ANTIPYRIN; ANTIFEBRIN. Most poisons towards the last.

IV. **The Patient is Cyanosed.**

ANILINE; ANTIFEBRIN; EXALGIN.

V. **The Patient is Delirious.**

BELLADONNA (noisy, pleasing delirium, "the insane root that takes the reason prisoner"); HYOSCYAMUS; STRAMONIUM; CANNABIS INDICA; ALCOHOL; CAMPHOR.

VI. **The Patient is Tetanised.**

NUX VOMICA; STRYCHNINE (think of Vermin Killers); ANTIMONY; ARSENIC. There may be a condition approaching tetanus from excess of pain—in poisoning by strong AMMONIA for example.

VII. **The Patient is Paralysed.**

PHYSOSTIGMINE; CONIUM (from below upwards); GELSEMIUM; ACONITE; ARSENIC; LEAD.

VIII. **The Pupils are Dilated.**

BELLADONNA and ATROPINE; HYOSCYAMUS; STRAMONIUM; OPIUM (in last stage); ACONITE; ALCOHOL; CHLORO-

FORM (when taken in liquid form); CONIUM.

IX. **The Pupils are Contracted.**

OPIUM (to a pin's point if large dose taken); PHYSOSTIGMINE; CHLORAL (during sleep).

X. **The Skin is Dry.**

BELLADONNA and ATROPINE; HYOSCYAMUS; STRAMONIUM.

XI. **The Skin is Moist.**

OPIUM; ACONITE; ANTIMONY; ALCOHOL; TOBACCO; LOBELIA. Almost any poison during the stage of collapse.

XII. **There is a Rash on the Skin.**

The presence of a rash on the skin may be of essential value as an aid to diagnosis but at the same time it must be remembered that a particular rash may be produced by several different drugs and that the same drug does not always bring out the same rash.

BELLADONNA and STRAMONIUM produce a rash which may be either erythematous or scarlatiniform. It may be followed by desquamation.

CHLORAL HYDRATE produces an erythema occurring at first in spots but afterwards more diffusely. Its earliest manifestation is on the head but soon it spreads all over the body following the course of the greater nerve tracks. Butyl-chloral-hydrate even in moderate medicinal doses may also excite an erythema.

ARSENIC brings on an eczema, or a rash like scarlet fever.

ANTIMONY is followed by a pustular rash, like small-pox.

BROMIDE of POTASSIUM produces an acne which may go on to the formation of boils or ulcers. It is seen chiefly on the face and back.

IODIDE of POTASSIUM may be followed by papules quickly becoming pustular and resembling acne, or by a petechial rash.

ANTIPYRIN causes an urticaria commencing on the inner side of the thighs and extending over the abdomen. It is accompanied by itching.

SALICYLIC ACID may be followed by diffuse erythema with œdema of the eyelids.

COPAIBA may induce an urticaria beginning usually on the hands in the form of bright red discrete stains, gradually spreading all over the body and accompanied by itching and tingling.

CUBEBS produces a similar rash.

OPIUM and MORPHINE exceptionally bring out urticaria or papulous or roseolous patches accompanied by itching.

QUININE also exceptionably brings out an erythema attended by distressing itching and tingling.

COD LIVER OIL may be followed by an acne from the elimination by the skin of some of its acrid principles.

Croton oil, tartar emetic, sulphur, hydrastis and arnica are well known rash producers when applied locally, and the acne of tar is very familiar.

The discoloration of the skin resulting from the local application of chrysophanic acid and the permanent staining from the long continued administration of nitrate of silver require no detailed notice.

XIII. **There is the Smell of the Drug in the Breath.**

PRUSSIC ACID; LAUDANUM; ALCOHOL (brandy, whiskey, &c.); CARBOLIC ACID; ACETIC ACID; AMMONIA; CHLOROFORM; CREASOTE; IODINE; PHOSPHORUS; CAMPHOR; NITROBENZOLE. The smell is not always a reliable guide; for example, laudanum is not uncommonly taken in porter.

XIV. **The Mouth and Tongue are Dry.**

BELLADONNA and ATROPINE; HYOSCYAMUS; STRAMONIUM; OPIUM.

XV. **There is Salivation.**

ARSENIC; AMMONIA; CANTHARIDES; EXALGIN. Most drugs which produce a corrosive action on the mucous membrane of the mouth or œsophagus. Mercury, jaborandi and muscarin may also be mentioned.

XVI. **The Mouth is Bleached.**

1. CARBOLIC ACID. Mucous membrane white and hard.
2. AMMONIA. Epithelium coming off in flakes.
3. POTASH; SODA.
4. NITRIC ACID. White soft or yellow.
5. CORROSIVE SUBLIMATE.

The numbness of the lips, mouth, and tongue, produced by Aconite will not be forgotten.

XVII. **The Patient is Vomiting.**

1. ARSENIC. Brown, mixed with blood.
2. ANTIMONY. White stringy mucus, may be tinged with blood.

3. DIGITALIS. Vomited matter has a grass green colour.
4. ACONITE.
5. COLCHICUM.
6. COLOCYNTH. And is freely purged.
7. AMMONIA. Stringy saliva mixed with blood; fumes with hydrochloric acid.
8. PHOSPHORUS. Vomited matter luminous in the dark.

XVIII. **The Patient is Purged.**

ARSENIC (continuous with much pain, stools mixed with blood); ANTIMONY; CORROSIVE SUBLIMATE (green in colour, mixed with blood); CANTHARIDES (blood and slime); DIGITALIS; COLCHICUM; COLOCYNTH.

XIX. **The Patient is suffering from Colic.**

LEAD (chiefly in region of navel, eased by pressure); COPPER; ARSENIC; COLOCYNTH.

XX. **The Patient is suffering from Cramp.**

ARSENIC; ANTIMONY; LEAD.

XXI. **The Drug was given Hypodermically.**

MORPHINE; ATROPINE; STRYCHNINE.

XXII. **The Poison was Inhaled.**

AMMONIA; PRUSSIC ACID; CHLOROFORM; ETHER; BENZINE; CARBONIC ACID GAS; CARBONIC OXIDE; COAL GAS; SEWER GAS, CESSPOOL GAS and EMANATIONS.

XXIII. **Poisons commonly used for Murder.**

ARSENIC; ANTIMONY; ACONITE; DIGITALIS; OPIUM; STRYCHNINE; PRUSSIC ACID.

XXIV. **Poisons commonly employed for Suicidal purposes.**

OPIUM and its preparations (commonest of all poisons); OXALIC ACID; RAT PASTE; PRUSSIC ACID; CHLORAL; SUGAR OF LEAD; STRYCHNINE. Patent medicines of all kinds unintentionally.

XXV. **Drugs commonly employed as Abortifacients.**

ERGOT; RUE; GIN and PENNYROYAL; SAVINE; BITTER APPLE (Colocynth, very popular); HICKERY PICKERY (Hiera Picra or Holy Bitter, a mixture of four parts of aloes and one of canella bark); SPANISH FLY (Cantharides); YEW TREE TEA; GREEN TEA in large quantities.

QUININE is supposed to exert a specific action on the pregnant uterus, but that it does so I do not for one moment believe, given, that is to say, in ordinary tonic doses. I

have frequently given pregnant women suffering from malaria large doses of quinine without in anyway disturbing their uterine arrangements. Two five-grain compound colocynth pills at bed-time would be far more likely to do harm.

ACTÆA RACEMOSA (Cimicifuga racemosa) is sometimes said to be an abortifacient, but there is very little truth in the statement; at all events half a drachm of the tincture three times a day is safe enough even in the later months of pregnancy.

PULSATILLA is supposed to be capable of producing abortion, but this again rests on very imperfect evidence.

PARSLEY is also said to be useful. The usual directions are:—"A handful of parsley chopped fine in a bottle of gin, allowed to stand a week, and a wineglassful three times a day." How far this proves efficacious I do not know, but the *rationale* is clear enough, parsley containing apiol which is reputed to be a powerful oxytocic.

My own belief is that there is no satisfactory evidence to show that any drug or combination of drugs employed alone, that is

to say without mechanical assistance, is capable of producing abortion except perhaps in the case of those exceptionally gifted women who have been so often pregnant that they abort almost as soon as they are looked at.

XXVI. **Indigenous Poisonous Plants.**

Woody Nightshade (*Solanum dulcamara*); Garden Nightshade (*Solanum nigrum*); Deadly Nightshade (*Atropa belladonna*); Aconite, Monkshood, Wolfsbane or Blue Rocket (*Aconitum napellus*); Foxglove (*Digitalis purpurea*); Spotted Hemlock (*Conium maculatum*); Arum (*Arum maculatum*); Colchicum (*Colchicum autumnale*); Bryony (*Bryonia dioica*); Henbane (*Hyoscyamus niger*); Fly Agaric (*Amanita muscaria*); Mezereon or Spruge Olive (*Daphne mezereum*); Laburnum (*Cytisus laburnum*); and a host of others. These are figured in Stephenson and Churchill's *Medical Botany*, and in Bentley and Trimen's *Medicinal Plants*.

Supposed Active Ingredients of Popular "Patent Preparations."

Neuraline, aconite with chloroform and rose water. *Morison's Pills*, aloes and colocynth. *James' Fever Powder*, antimony. *Anti-Fat*, Fucus vesiculosus or bladder wrack. *Hunter's Chloral*, chloral with syrup of tolu and elder flower water. "*Fluid Lightning*," an American application for neuralgia, aconitine, with essential oil of mustard, glycerine, and alcohol. *Perry Davis' Pain Killer*, spirits of camphor, tincture of capsicum, tincture of guaiacum, tincture of myrrh and alcohol. *Brown's Bronchial Troches*, cubebs, conium, acacia, liquorice and sugar. *Lady Webster's Pills*, powdered aloes, powdered mastich and petals of red roses in syrup of wormwood. The pills known as *Lady Heskett's* and *Lady Crespingy's* have a similar composition. *Valette's Pills* contain sulphate of iron, carbonate of soda, honey and syrup. *Parr's Life Pills*, aloes, rhubarb, jalap, extract of gentian, oil of cloves, soft soap, &c. *Holloway's Pills*, aloes, jalap, ginger and myrrh made into a mass with mucilage; might give rise to

dangerous symptoms if administered to young children or to persons debilitated by age or disease. *Holloway's Ointment*, fresh butter, beeswax, yellow resin, vinegar of cantharides, Canada balsam, expressed oil of mace and balsam of Peru or liquid storax. It is said that "no two samples are precisely of the same colour or consistence." *Mrs. Winslow's Soothing Syrup*, morphia with essence of anise and syrup of balsam of tolu. *Mother's Friend*, opium with carminatives. *Indian Tincture*, capsicum, cannabis indica, ether, and methylated spirit. *Mother Seigel's Curative Syrup*, concentrated compound decoction of aloes with borax, capsicum, gentian, oil of sassafras, oil of winter green, taraxacum, treacle and rectified spirit. *Reynold's Gout Specific*, colchicum. *Blair's Gout Pills*, finely ground colchicum corms. *Injectio Brou*, sulphate of zinc, sugar of lead, laudanum, tincture of catechu and water. *Locock's Pulmonic Wafers*, lactucarium, ipecacuanha and squills. *Eau de Fleurs de Lys*, "an infallible banisher of freckles," a milky fluid consisting of two and a half per cent. of calomel, a trace of corrosive sublimate and common salt, with water scented with orange flowers. *Eau de Blanc de Perles*, an

alkaline fluid with a thick deposit of about fifteen per cent. of carbonate of lead, scented with otto of roses and geranium. *Lait de concombres* consists of soap, glycerine and cottonseed oil made into a semi-emulsion with rose water. *Norton's Chamomile Pills*, aqueous extract of aloes, extract of gentian and essential oil of chamomile. *Kitchener's Peristaltic Persuaders*, probably compound rhubarb pills with a little caraway. *Keating's Cough Lozenges*, lactucarium, ipecacuanha, squills, extract of liquorice, sugar, and mucilage of tragacanth. *Ruspini's Styptic*, a strong solution of gallic acid in spirit of roses and perhaps a little sulphate of zinc. *Roche's Embrocation*, olive oil mixed with oil of amber, oil of cloves and oil of lemons. *Holt's Specific* (for whooping cough), also known as *Hooper's* is said to contain half a grain of tartar emetic in the dose. *Cohosh* is actæa racemosa or cimicifuga. *Hamlin's Wizard Oil* contains camphor, ammonia, sassafras, cloves, chloroform, turpentine, and spirit. *Haarlem Oil* is a mixture of balsam of sulphur, Barbadoes tar, oil of amber, oil of turpentine, and linseed oil. *Barker's Poisoned Wheat* for killing birds owes its poisonous properties to Cocculus Indicus.

Spirone used as a inhalation in consumption and bronchitis was found on analysis to be a two per cent. solution of iodide of potassium mixed with glycerine and acetone. *St. Jacob's Oil* largely used for the relief of pain contains turpentine and aconitine.

Warner's Safe Cure was found on analysis to contain in each bottle extract of lycopus virginicus 20 grammes, extract of hepatica 15 grammes, extract of gaultheria half a gramme, nitre 2½ grammes, alcohol 80 grammes and glycerine 40 grammes, the rest being water. Lycopus virginicus is the bugleweed of the United States. As more than half a century has elapsed since medical virtues were ascribed to it and as they have up to now failed to receive recognition it may be assumed that they are not of a very high order. Hepatica is the common liverwort respecting which it is stated in the National Dispensatory that:—"Its medicinal value is very small and hardly entitles it to a place in the Materia Medica."

The Preservation of Specimens.

If it is determined to submit the vomited matter, the contents of the stomach or portions

of the viscera to a chemical expert for analysis, it is necessary that they should be preserved according to certain rules.

1. They should be placed in wide-mouthed glass bottles, previously cleansed by scouring them with sand, rinsing with strong hydrochloric acid and then thoroughly washing out with water.

2. No antiseptic of any kind should be added.

3. The mouths of the bottles should be covered with oil-silk and not with calico, linen, or paper.

4. A label should be attached, bearing the name of the deceased, the nature of the contents, the date of removal and the signature of the medical attendant.

In forwarding the specimens it would be as well to state the nature of the symptoms observed so as to afford the analyst some clue as to the nature of the poison he is to look for, but this is not essential.

Whether the medical man should make a chemical investigation himself will depend partly on the opportunities at his disposal and partly on his familiarity with the modes of investigation required, but in any case

he should not use more than half the material.

In some cases the tests are chiefly chemical and in others almost entirely physiological. An analytical chemist is as a rule not the best man to undertake a pharmacological investigation.

An Unsuspected Source of Poisoning.

THERE is a special source of accidental poisoning which is not generally recognised. I refer to the use of pills containing active ingredients and coated with a preparation which dissolves very slowly. It is perhaps not generally known that some coatings take three or four days to dissolve. If a patient, for example, were taking digitalis pills three or four times a day it might happen that no effect of any kind would be experienced until after an unusually hearty meal, when all the coatings might be dissolved at once and the patient would unexpectedly show symptoms of poisoning. This is not a mere random statement for I recently had a case of digitalis poisoning under my care which

was clearly traced to this source. I have made a number of observations on various pill-coatings and find that some of them take hours and even days to dissolve in artificial gastric juice.

THE ANTIDOTE CASE.

The Antidote Case should contain every drug and instrument likely to be required in a case of poisoning. It should be to the Toxicologist what the Midwifery bag is to the Obstetrician. It should always be kept filled ready for use, so that in case of emergency the doctor would simply have to take or send for his bag, and would not have to look for stray bottles or instruments at a time when every moment is of importance.

An Antidote Case should be kept in readiness at every police station, and in the casuality room of every hospital. It is astonishing how badly, even until quite recently, some of our large hospitals were furnished with appliances for the treatment of cases of poisoning. There are even now many hospitals where there is

no efficient douche for use in cases of opium poisoning.

It is a good plan to inspect the case at intervals to see that everything is in working order. The piston of the hypodermic syringe always works badly if not looked after. A little vaseline may be applied with advantage to the stoppers of the bottles.

An Antidote Bag or Case should contain:—

A. Instruments.

1. Stomach-pump or stomach-tube, which might also be used as an enema apparatus. There should be a small œsophagus tube for children.
2. Hypodermic syringe. A cap at the end to prevent the piston from getting dry is essential.
3. Flexible catheter, No. 8.

B. Emetics.

1. Sulphate of zinc in half-drachm powders; one or two to be given in hot water, repeated if necessary.
2. Powdered ipecacuanha in twenty grain powders; one or two to be given in water as an emetic.

3. Apomorphine in tabloids or a 1 in 50 solution of the hydrochlorate in water. One tabloid or five drops hypodermically as an emetic.

C. Stimulants.

1. Brandy, four ounces.
2. Sal volatile, four ounces.
3. Chloric ether, four ounces.
4. Coffee in $\frac{1}{4}$ lb. tin; to be used as an enema in poisoning by opium or other narcotics.

Caffeine may be substituted for the coffee. The best solution for hypodermic use is made by dissolving 20 grains of caffeine and $17\frac{1}{2}$ grains of salicylate of sodium in a drachm of water. It contains a grain in 3 minims, and 6 minims should be given at a dose. It must be remembered, however, that the warmth contained in a pint of hot coffee is not without benefit.

D. Antidotes.

1. Dialysed iron, sixteen ounces; should be given *ad libitum* in cases of arsenic poisoning.
2. Acetic Acid, four ounces; two teaspoonfuls or more in water in cases of poisoning by potash, soda, &c. To be frequently repeated. Vinegar is a good substitute.

3. Syrup of Chloral, four ounces; of great value in strychnine poisoning. Three drachms (30 grains of chloral) may be given to begin with.
4. French Oil of Turpentine, two ounces; as an antidote in phosphorus poisoning. To be given in half-drachm doses every quarter of an hour.
5. Heavy magnesia (Magnesia ponderosa); may be given almost *ad libitum* in poisoning by acids.
6. Tannic Acid, two ounces; in strychnine poisoning may be given in teaspoonful doses.
7. Bromide of potassium in two drachm powders; in strychnine poisoning give two powders to begin with, and follow with one every ten minutes for an hour or more.
8. Nitrite of Amyl in a stoppered bottle or in capsules containing 5 minims in each. To inhale in chloroform poisoning, and in poisoning by aconite.

9. Chloroform, four ounces, for strychnine poisoning.

E. Hypodermic Injections.

1. Sulphate of Atropine solution (1 in 100), one drachm, for poisoning by aconite, morphine, pilocarpine, &c. The ordinary dose for hypodermic use is two minims, repeated in a quarter of an hour if necessary.
2. Acetate of Morphine solution (1 in 10), one drachm, useful to ward off shock. Ordinary dose for hypodermic use five minims.
3. Aconitine (English) solution (1 in 240) one drachm, for poisoning by digitalis. Two minims hypodermically; may be repeated in half an hour.
4. Pilocarpine Nitrite (1 in 20) one drachm; given in ten minim doses, frequently repeated, in poisoning by belladonna or atropine.
5. Nitrate of Strychnine solution (1 in 50) one drachm; in chloral poisoning given in two minim doses.
6. Tincture of Digitalis, one drachm; in aconite poisoning in 20 minim doses hypodermically.

Tabloids of atropine, morphine, &c., may be substituted with advantage for many of these solutions. If the necks of bottles are not carefully ground, the stoppers either leak, or at a critical moment are found to be firmly fixed, whilst tabloids occupy less room, and need not be in stoppered bottles.

F. The Poison Book (latest edition).

My antidote case has been of the greatest possible use to me. I remember a case in point. A lady's husband gave her four table-spoonfuls of syrup of chloral by mistake. He did not think of it for some time after, in fact not until they had been in bed for nearly an hour. When I saw the patient she was comatose, her face was livid, the respirations were slow and irregular, and the extremities were deadly cold. I soon got to work with the stomach-tube and washed out the stomach with plenty of warm water. A table-spoonful of sal volatile was introduced in the same way, and a dose of strychnine was given hypodermically. The arms and legs were well rubbed, nitrite of amyl was inhaled, and in half an hour the

patient had revived sufficiently to swallow some hot strong coffee. She was all right next day, but had it not been for the antidote case and the fact that everything was at hand, I am afraid it would have gone badly with her.

A small battery is often useful and in cases of poisoning by nitric acid or by ammonia, tracheotomy instruments may be required. In cases of prolonged insensibility the bladder should be empted by a catheter.

THE STOMACH-PUMP.

EVERY doctor should have a stomach-pump, or what is better, a stomach-tube. It may not be wanted for years, but it may be wanted to-morrow, and a life, or many lives, may depend on its being at hand. A stomach-pump with flute key action and everything complete, may be obtained for £2 or less, and any one can use it. The great point to remember is to fill the stomach with water before trying to empty it. The stomach should not only be emptied, but thoroughly washed out. Antidotes are best introduced in this way. In cases of

poisoning with mineral acids—nitric, hydrochloric and sulphuric acids for example—the stomach-tube is far safer than the stomach-pump.

In cases of emergency it is not a difficult matter to rig up an apparatus which will effectually empty and wash out the stomach without a stomach-pump. Take a piece of India-rubber tubing, about six or eight feet long, and pass it down the œsophagus till it reaches the stomach, now hold the other end well above the head, and by means of a funnel pour in water till the stomach is nearly full If the tube be pinched while full of water, and the lower end placed in a basin below the level of the stomach, it will act as a syphon and the stomach will be emptied. This may be repeated three or four times till the water comes back quite clear and free from smell. In the absence of a funnel a common India-rubber bottle may be used to fill the tube, or, for the matter of that, even the mouth. A common enema apparatus will do very well to inject the water, and if it has no valves, or if they do not work—not an uncommon occurrence—it will help to form part of the syphon.

EMETICS.

THE Emetics commonly employed are the following:—

1. Apomorphine.

One-tenth of a grain of the hydrochlorate—5 minims of the 1 in 50 solution—hypodermically. The Injectio Apomorphinæ Hypodermica may be used. The statement "that the solution should be made as required for use" is all nonsense. Apomorphine is a powerful emetic and acts promptly, without the production of much nausea or depression. It is said that apomorphine is a dangerous drug to use, but I have not found this to be the case. The solution turns green in a day or two, but retains its activity. I gave a patient a hypodermic injection of 4½ minims of a 1 in 50 solution of hydrochlorate of apomorphine, which had been kept exposed to the light for three months, and in three minutes it acted powerfully, completely evacuating the stomach. Six months later I used the same solution in the same dose, and it answered equally promptly, the patient vomiting at intervals for three or four hours. There was no irritation

at the seat of injection. Smaller doses are sometimes recommended, but in cases of poisoning prompt action is essential. If given by the mouth it simply acts as an expectorant. Although prepared from morphine it differs so completely in its action from that alkaloid that it is given in cases of opium poisoning. The tabloids are reliable, the tenth of a grain always producing emesis in from three to four minutes.

2. Common Salt.

Two table-spoonfuls in half a pint of tepid water. Not a very certain emetic but has the advantage of being always at hand.

3. Mustard (the flour).

A table-spoonful in half a pint of water. This too is readily procured.

4. Sulphate of Zinc.

Thirty grains in water, repeated if necessary, prompt and safe.

5. Powdered Ipecacuanha.

Thirty grains or more in water; produces very little depression, and does not irritate the mucous membrane of the stomach.

6. Ipecacuanha Wine.

Two table-spoonfuls in water; rarely prompt in its action.

7. Sulphate of Copper.

From five to ten grains dissolved in water.

8. Tartar Emetic.

Three grains in water—slow in action and usually causes much nausea and depression.

9. Antimony Wine.

An ounce or more in water.

10. Carbonate of Ammonium.

Half a drachm or more in water.

11. Powdered Alum.

A table-spoonful in water. Not very reliable.

In cases of poisoning it is not so much a question as to which is the best emetic as to which can be obtained at once. Many people vomit very readily, almost at will, and with them a draught of tepid water, dirty or greasy by preference, with the introduction of the fingers into the throat, will speedily effect the desired result.

In many cases it is desirable to give a combined emetic. Thus, we may begin with a table-spoonful of mustard in a tumbler of water, and follow it as quickly as possible with an

Emetic Draught.

Sulphate of Zinc . . .	30 gr.
Powdered Ipecacuanha .	50 gr.

To be taken in water.

This again may be followed by a hypodermic injection of gr. $\frac{1}{10}$ of Apomorphine (5 minims of the 1 in 50 solution) repeated if necessary.

The action of the emetic is facilitated by giving plenty of tepid water. In narcotic poisoning it is often a most difficult matter to get the patient to vomit.

MULTIPLE ANTIDOTES.

Many attempts have been made to formulate a multiple officinal antidote, to obtain, that is, a mixture which would neutralize the toxic action of most, or even all, of the active poisons. Such attempts are hardly likely to prove successful, but the following is probably the best formula for such a preparation :—

Saturated solution of	
Sulphate of Iron	100 parts
Water	800 ,,
Calcined Magnesia	88 ,,
Purified Animal Charcoal . .	40 ,,

The iron solution should be kept separately and the magnesia and animal charcoal mixed in a bottle with water. When required for use the iron is poured into the bottle and the whole

shaken well together. It may be administered *ad libitum*, a wine-glassful or more at a time. It is said to render inert preparations of arsenic, zinc, and digitalis, and to partly neutralize the action of mercury, morphine, and strychnine. It has no action on the alkalies, and none on phosphorus, antimony or hydrocyanic acid.

Iodide of starch has also been recommended as a multiple antidote. It is said that if given in large doses, it is efficacious in poisoning by sulphuretted hydrogen, the alkalies, the alkaline sulphides and especially the alkaloids with which iodine forms an insoluble compound.

TRANSFUSION.

In many cases of poisoning transfusion may be employed with advantage. It is not necessary to use blood, as a saline solution will do just as well. It is best to inject it into the circulation direct, but in the absence of a suitable apparatus it may be introduced by the stomach-pump into the stomach or rectum from which it is easily absorbed. The following is the formula I use:—Common salt, one drachm, bicarbonate of sodium, four grains,

chloride of calcium, three grains, chloride of potassium, one grain, water, twenty ounces at a temperature of 100° F. On several occasions I have injected this into the peritoneal cavity with good results. The only apparatus employed (*Lancet*, April 21st, 1883), was the cannula of an aspirator attached to a piece of india-rubber tubing, the fluid being allowed to run in by siphon action.

MASSAGE.

Massage is undoubtedly of value in the treatment of cases of acute and chronic poisoning. In acute chloral poisoning and poisoning by aconite it serves to maintain the temperature, whilst in mercurial poisoning and chronic lead poisoning it does as much as anything to restore the condition of the affected muscles. The best methods are *effleurage* and *pétrissage* combined, but in opium poisoning *tapotement* is of service. To be of any value it must be performed by a qualified person. Speaking from some experience I should say that it is one of the best modes of treatment for the morphine habit. It is undoubtedly useful in cases of chronic lead and chronic mercury

poisoning. For details of methods see *Masso-therapeutics or Massage as a Mode of Treatment*, 5th edition.*

INHALATION OF OXYGEN.

In many cases of poisoning I find the inhalation of Oxygen useful. It is supplied in cylinders under pressure. The apparatus for inhaling is of the simplest possible description. If the patient is still breathing naturally the gas is taken into the lungs without difficulty and in other cases artificial respiration will ensure absorption. The cylinders can now be obtained without difficulty.

FATAL DOSE.

It is no easy matter to say positively what is the fatal dose of any particular poison. Much depends upon the age of the patient, the condition of the stomach as regards food, the occurrence of copious and early vomiting, the administration of appropriate remedies, and so on. The question of tolerance is not to be

* London, H. K. Lewis, 136 Gower Street.

lost sight of, especially in dealing with such drugs as opium, alcohol, arsenic, and corrosive sublimate. In many of the recorded cases the exact quantity taken is not known, whilst in others the strength of the preparation is not given. Amongst the most energetic toxic agents are Aconitine (gr. $\frac{1}{10}$), Digitaline (gr. $\frac{1}{4}$), Hydrocyanic acid (gr. i.), Strychnine (gr. i.-ii.), Nitro-Benzol, and above all some of the animal poisons.

THE LEGAL ASPECTS OF CASES OF POISONING.

Should the patient die, what are you to do? If you suspect foul play leave no stone unturned to bring the guilty parties to justice. Place yourself in the murdered man's position, and act for him. Do not leave the house till the case is in the hands of the police. Take charge of vomited matter, bottles, instruments, &c., and lock them up.

In case of accidents or suicide it is not incumbent on you to act the part of a police officer.

If you are called in to a case of attempted

suicide by poisoning is it your duty to inform the police? My answer to this is emphatically "No." I am perfectly aware that in a well-known libel case an expert witness gave it as his opinion that "a medical man is obliged to inform the Public Prosecutor of any crime which has been committed or is intended to be committed." Attempted suicide is clearly an offence against the law and it is possible that a medical man who saved the patient's life might be charged with being an accessory after the fact if he failed to give information, but he would be very unwise to do so and it is not to be supposed for one moment that any jury would convict under those circumstances. If doctors were to divulge information which comes to them under the seal of professional confidence the public would soon cease to consult them.

Do not make a post-mortem examination until you receive an order from the Coroner to do so. If you are not accustomed to make post-mortem examinations, and the case is of importance and likely to attract public attention, call in a skilled pathologist to "assist" you. You will give evidence first, and he can confirm your statements. Do not discount

your evidence by telling people what you find; they will hear at the inquest.

If you are ordered to make an analysis of the contents of the stomach, or to examine the viscera for poison, you had better decline the responsibility unless you have a better knowledge of chemistry than falls to the lot of most medical men. Such work should be left to those who make it a special study. You are a medical man practising your profession, and have no wish to usurp the functions of the analytical chemist. You may get some useful hints, however, from Wormley's *Micro-Chemistry of Poisons*.

Before giving evidence think over very carefully what you are going to say. Better to rehearse it a dozen times in the privacy of your own chamber than to break down in public. Arrange your facts clearly and concisely, and divest your language as far as possible of technicalities. Give your evidence slowly, for it has to be taken down, not only by the Coroner, but by the reporters. Give it in your own way, and do not be interrupted by anyone. The Coroner may stop you and say "Quite so, and then you applied the appropriate remedies." This is all very well if you

forgot something, but if your treatment has been strictly correct let the Court have the benefit of it.

Think over carefully the questions you are likely to be asked, and be prepared to answer them. Read up the literature of the subject, and let your knowledge be up to date. If you do not know much about it, telegraph to some leading toxicologist and get him to coach you up in it, or at least to send you an abstract of the recent literature. It will pay you in the long run. Barristers constantly do this—why should not you?

Answer concisely, and to the point, and never volunteer a statement, unless it be to correct a false impression you may have created by a previous answer. Do not imagine that the object of cross-examination is to elicit the truth.

Do not be afraid of cross-examination. If you have read up your subject you should be more than a match for any Barrister. His knowledge is of necessity superficial, and he is hampered by the fear of displaying his ignorance.

PTOMAINES—CADAVERIC ALKALOIDS.

Every medical man should get up the subject of Ptomaines (from πτῶμα, a dead body) before giving evidence in a case of poisoning. They are supposed to be alkaloids generated during decay and they closely resemble the vegetable alkaloids—veratrine, morphine, and codeine, for example—not only in chemical characters, but also in physiological properties. They are commonly produced in substances which after exposure have been excluded from the air, in buried corpses for example. Ptomaines are not of necessity of cadaveric origin. They are found in a number of putrefying substances such as sausages and tinned foods. Ptomaines or bodies closely allied to them have been extracted from decomposing urine and from human saliva, but these in all probability are not toxic. From the urine of patients suffering from various diseases poisonous principles have been obtained. In the bodies of persons exhumed after dying of acute arsenical poisoning peculiar arsenical poisonous bases

are found known as "Arsines" (see AQUA TOFANA). A common defence in case of poisoning is that the reactions obtained were due to cadaveric alkaloids and not to any poison administered.

THE FEE.

I AM often asked what should be the fee in a case of poisoning. It is not an easy matter to discuss, but still the subject cannot be passed by in silence. Clearly it is permissible to charge more for the treatment of a case of poisoning than for an ordinary visit. The doctor may be kept for some considerable time, and the duties he has to perform are not always of an agreeable nature. He is sent for at a moment's notice, and as it is a matter of life and death he has to go at once, possibly to his great inconvenience and to the inconvenience of his other patients. The responsibility is great, and the slightest error in judgment may result in a public enquiry and subject him to ridicule and opprobrium. Moreover, he has to furnish himself with special and expensive apparatus which is

rarely needed, and is useless for other purposes. Taking these facts into consideration, I think his fee should be the fee he would charge the same people in an ordinary midwifery case. It will vary according to the circumstances and social position of the patient, from two to twenty guineas. A specialist, and by that I mean one who has made the treatment of cases of poisoning his particular study, would be justified in charging from twenty-five to fifty guineas, including the subsequent attendance. If the patient's husband is a rich man, fifty guineas is not too much for saving his wife's life—that is unless he would prefer being a widower.

WHAT TO DO

IN

CASES OF POISONING.

ACETIC ACID.

How taken.—Not often used as a poison. Glacial acid used for destroying warts, may be taken by mistake. Vinegar taken by women to prevent corpulence.

Symptoms.—Glacial acid would destroy mucous membrane of œsophagus and stomach, and perhaps give rise to perforation. Odour in breath, great pain in abdomen, probably convulsions, collapse, death.

Treatment.—1. **Soap and water.** Large draught of soap and water to be taken at once. Stomach-pump not to be used.

2. **Lime-water, chalk and water,** or **white-wash and water,** if at hand. **Magnesia** may be given freely.

3. **Milk, oil,** and thick **gruel** may be used.

4. **Morphine.** A hypodermic injection of half a grain of morphine to ward off shock.

ACONITE.

How taken.—A very active and deadly poison. The plant Monkshood, Wolfsbane

or Blue Rocket (*Aconitum napellus*) found growing in every cottage garden—all parts poisonous. Root often mistaken for horse-radish, and the leaves have been eaten in salad. In one case aconite root dropped from a van passing through the streets. Tincture mistaken for a cordial. Fleming's tincture might easily be mistaken for sherry, and was on one occasion mistaken for flavoured spirit. Symptoms of poisoning from inhaling the dust in powdering. Death from use of "Neura-line," and other applications for neuralgia. Aconite liniment taken instead of medicine. Overdose of strong tincture taken for a cold. May be used for purposes of suicide or for murder. Aconitine pills sold freely, and largely used in treatment of neuralgia.

Symptoms.—Warmth at pit of stomach, tingling of mouth, lips and tongue, feeling of constriction of throat, deglutition frequent, tingling spreads all over body, numbness at tips of fingers and loss of sensibility, nausea and often vomiting, but may be absent. Loss of sensation, deafness, dimness of sight. Paralysis first of lower, then of upper, ex-tremities. Pulse reduced in strength and frequency, then irregular, and finally almost

imperceptible. Respirations shallow, feeble, infrequent. May be convulsions, but as a rule no delirium, and no coma. Pupils generally dilated, but may be contracted if no convul-sions. Prostration great, but mind clear to the last, often with fear of approaching death. Cold clammy perspirations towards the end, and often death quite suddenly, after some slight exertion, as attempting to sit up.

Fatal Dose.—Death after taking a drachm of the tincture, also from merely tasting Fleming's tincture. Recovery after taking three drachms of Fleming's tincture. Flem-ing's tincture is six times as strong as the B.P. solution.

Treatment.—1. **Stomach-tube** or **Emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (a scruple in water), or of ipecacuanha wine (two table-spoonfuls in water), or a hypodermic injection of apomorphine (five minims of the one in fifty solution).

2. **Stimulants** freely, brandy, chloric ether, or sal volatile. If not retained by the stomach, to be well diluted and injected into the rectum, or subcutaneously.

3. **Atropine.** Give a hypodermic injection

of gr. $\frac{1}{50}$ of atropine (2 minims of the 1 in 100 solution), or thirty drops of tincture of belladonna by mouth or rectum. Be guided by pulse, and should it improve, repeat the dose in a quarter of an hour.

4. **Warmth.** Apply warmth to extremities by hot towels and hot water bottles. Friction with the warm hand. Massage. Mustard poultice or mustard leaf over the heart.

5. Keep the patient strictly in the **recumbent position.**

6. **Digitalis.** If no improvement, give a hypodermic injection of gr. $\frac{1}{100}$ of digitalin or twenty minims of tincture of digitalis, repeating it in twenty minutes if the pulse improves.

7. **Nitrite of Amyl.** Inhalations of nitrite of amyl.

8. **Artificial respiration** for two hours if necessary.

Tests.—Aconitine may be extracted from organic mixtures such as the contents of the stomach and the urine by Stas's process. It gives the usual alkaloidal reactions but there are no distinctive tests. The pharmacological actions such as the tingling of the tongue and the effect on the frog's heart are sufficiently characteristic. This was well brought out in the Lamson case.

ACONITE AND BELLADONNA.

How taken.—This combination might be taken for suicidal purposes. More frequently a liniment is taken by mistake.

Symptoms.—Would depend much on the relative proportion of the two drugs. Must not be forgotten that Belladonna to some extent antagonizes Aconite. Probable that symptoms would be the same as in aconite poisoning, but failure of heart's action would not be so marked, the pupils would be dilated and the skin would be dry, with perhaps a rash resembling scarlet fever. Delirium might be present.

Treatment.—1. **Stomach-tube** or **Emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (a scruple in water), or of ipecacuanha wine (two table-spoonfuls in water), or a hypodermic injection of apomorphine (5 minims of 1 in 50 solution).

2. **Stimulants** freely, brandy, spirits of chloroform, or sal volatile. If not retained dilute and inject into rectum.

3. **Warmth** to extremities by hot towels,

or hot-water bottles. Friction with the warm hand. Massage. Mustard leaf or mustard poultice over the heart.

4. Keep the patient in the **recumbent position.**

5. **Nitrite of Amyl.** Inhalations of nitrite of amyl.

6. **Artificial respiration** for two hours if necessary.

ACONITE AND MORPHINE.

How taken.—Not a common combination. Might be taken for suicidal purposes, or in a liniment by mistake.

Symptoms.—Would probably be those of Aconite poisoning, with coma and contracted pupils.

Treatment.—1. **Stomach-tube** or **Emetic** of mustard (a table-spoonful or more of the powder in water), or of sulphate of zinc (twenty grains or more in water), or of ipecacuanha wine (an ounce in water), or a hypodermic injection of apomorphine.

2. **Rousing.** Flap patient with a wet towel especially about the chest, and over the region of the heart. Give him **sal volatile** and

chloric ether freely. Keep him in the recumbent position and do not attempt to walk him about.

3. **Warmth to the extremities** by hot towels, or hot water bottles. Friction with the warm hand.

4. **Atropine.** A hypodermic injection of gr. of $\frac{1}{50}$ sulphate of atropine (2 minims of the 1 in 100 solution), or thirty minims of tincture of belladonna by mouth or rectum. If no improvement repeat the dose in a quarter of an hour.

5. **Coffee.** An enema of a pint of hot strong coffee.

6. **Nitrite of Amyl.** Inhalations of nitrite of amyl.

7. **Battery.** Interrupted current to extremities.

8. **Artificial respiration** to be maintained for two hours if necessary.

ACONITINE—ACONITIA.

Usually described as an alkaloid obtained from *Aconitum napellus* or Monkshood, but much of our English Aconitia is in all pro-

bability extracted from *A. ferox*, the Indian Aconite.

Commercial aconitine is not a simple substance but a mixture of several alkaloids, including aconitine, pseudoaconitine, and picraconitine. It is generally stated that English aconitine is at least seventeen times as active as the German, the French being intermediate in power, but this classification into English, French, and German is unreliable and unscientific. It is said that Merck's aconitine is thirty times as active as Friedlander's whilst Petit's is eight times as active as Merck's. This is a matter of some importance, for the substitution of one kind for another might give rise to serious results.

I have seen a case of poisoning which resulted from the too energetic use of aconitine ointment rubbed into the brow as a remedy for neuralgia.

For symptoms and treatment see *Aconite*.

ALCOHOL.

How taken.—Usually for a wager or from bravado. Vapour of alcohol may cause death.

"Absolute alcohol" is alcohol free from water; "proof spirit" is a mixture of spirit and water, containing 49·24 per cent. of alcohol, *i.e.*, half and half; every half per cent. of alcohol above this corresponds to one degree over-proof; "methylated spirit" is spirit mixed with ten per cent. of wood naphtha. Percentage of alcohol in some common alcoholic drinks:—Brandy 53, Rum 53, Whiskey 53—54, Gin, 51, Port 20—25, Sherry 15—19, Burgundy 13—14, Claret 10—17, Hock 8—10, Strong Ale 6, Stout 6, Porter 4, Small Beer 1.

Symptoms.—Usually appear at once, at all events within an hour. Confusion of thought, giddiness, inability to stand or walk, tottering gait, vacant expression, face flushed but may be pale, conjunctivæ congested, lips livid, breath alcoholic, skin covered with sweat, pupils dilated and fixed, but may be contracted, convulsions, stupor, coma and death. Remission of symptoms not uncommon, with death quite suddenly some hours, or even days, after apparent recovery.

Diagnosis.—Often difficult. Most likely to be confounded with apoplexy, concussion of brain or opium poisoning. History of case and examination of head for marks of violence

may help you. Odour of breath and of contents of stomach also a guide. In poisoning by alcohol face usually flushed, and pupils dilated; in opium poisoning face usually pale, and pupils contracted, but to this many exceptions. Excitement would be in favour of alcohol; remissions rare in opium poisoning. Not at all uncommon to find concussion or even fracture of the skull in conjunction with poisoning by alcohol. Laudanum frequently taken in porter or stout. If in doubt act on supposition that you are dealing with a case of serious injury. Hesitate before sending away a man who is intoxicated; "drunk or dying" is a difficult problem.

Fatal Dose.—Adult; death from half a pint of gin, also from two bottles of port. Recovery from quart of gin, also from quart of whiskey; from two bottles of port; from pint and a half of mixed gin and brandy. Child; death from half a pint of gin, from quartern of rum, and from two ounces of gin. Recovery from three ounces of rum.

Treatment.—1. **Stomach-tube** or **Emetic** of apomorphine (5 minims of the 1 in 50 solution hypodermically), or of mustard (a tablespoonful of the powder in water), or of sulphate

of zinc (a scruple in water), or of ipecacuanha wine (two table-spoonfuls in water).

2. If patient insensible **rouse him** in every way, make him walk about, flap him with wet end of towel, shout at him, pinch him, and apply **battery** (interrupted current) to legs. Massage.

3. **Coffee.** Give him hot strong coffee (a pint) by mouth or enema.

4. The **cold douche,** a jug of water being steadily poured over the head from a height from time to time. The alternate hot and cold douche is useful. Do not use cold water too freely if patient is in a condition of collapse.

5. **Nitrite of Amyl.** Inhalations of ammonia or nitrite of amyl.

In ordinary cases of drunkenness, such as are found in the casualty room of the Hospital every Saturday night, a hypodermic injection of apomorphine with, if necessary, the cold douche should be tried.

ALMONDS, ESSENTIAL OIL OF—OIL OF BITTER ALMONDS.

Contains from ten to fifteen per cent. of hydrocyanic acid, *i.e.*, from five to eight times as strong as the Prussic Acid of the Pharmacopœia.

Death from seventeen drops; recovery after four drachms.

For symptoms and treatment, see HYDROCYANIC ACID.

ALMOND FLAVOUR—SPIRITS OF ALMONDS—ESSENCE OF PEACH KERNELS.

Consists of one part of Essential oil of Almonds and seven of spirit. About the same strength as Prussic Acid and largely used by cooks for flavouring pastry, blanc mange, &c. Found in every kitchen.

Death from thirty drops; poisoning in a child from eating tapioca pudding flavoured with it.

For symptoms and treatment, see PRUSSIC ACID.

AMMONIA—LIQUOR AMMONIÆ—SPIRITS OF HARTSHORN.

How taken.—Mistaken for sal volatile. In liniments, *e.g.*, Linimentum Camphoræ Compositum and Linimentum Ammoniæ. Indiscriminate use in cases of fainting especially when too strong a solution applied to the nose. The strong solution of ammonia—liquor ammoniæ fortior—is three times as strong as the solution of ammonia—liquor ammoniæ.

Symptoms.—Usually at once, burning pain in mouth, throat, chest and stomach, patient in great agony, lips and tongue swollen, red and glazed and covered with pieces of detached epithelium. Suffocative cough, violent dyspnœa, vomiting with copious discharge of salivary fluid mixed with blood. Face pale and anxious, eyes small, haggard and injected. Pulse slow, limbs cold. Irritation of larynx, lungs and air passages; voice reduced to a whisper or even lost. Death at once, or not till some days after, from affection of throat and air passages.

When acute symptoms have passed off there may be indications of constriction of œsophagus or of gastric ulcer. In a case recently under my care a lady went into a chemist's shop and asked for a dose of sal volatile in water. She is said to have been supplied with two drachms of aromatic spirit of ammonia in an ounce and a quarter of water. This statement may or may not be correct, at all events after the acute symptoms had passed away there was complete loss both of taste and smell, a condition which promises to be permanent. It is probable that it was the liquor ammoniæ which was supplied in place of the sal volatile.

Merely inhaling vapour may cause violent dyspnœa, cough and irritation of the larynx.

Diagnosis.—Not difficult. Sudden onset of the symptoms, smell of ammonia in breath, white fumes with rod dipped in hydrochloric acid.

Fatal dose.—Two drachms of the strong solution may prove fatal, half an ounce usually fatal, but recovery recorded after an ounce had been taken.

Treatment.—1. **Vinegar** freely diluted with water. **Lemon or orange juice,** given freely.

Acetic acid or any other acid if diluted with large quantities of water. Toilet vinegar may be used. If power of swallowing lost, inhalation of acetic acid or vinegar from pocket handkerchief.

2. **Demulcent drinks** such as white of egg and water, milk, barley water, arrowroot, &c., olive oil.

3. If much dyspnœa from œdema of the glottis it may be necessary to perform **tracheotomy.** Inhalation of chloroform may relieve spasm. Steam from bronchitis kettle or spray apparatus may be useful.

4. To ward off shock and relieve pain hypodermic injection of morphine (5 minims of the 1 in 100 solution).

ANILINE

Is ammonia with one atom of hydrogen replaced by one of the compound organic radical phenyl. Is obtained from coal-tar or from nitro-benzol. When pure is a colourless liquid, but as usually met with has a reddish tinge. It has an aromatic burning taste and a faint vinous odour. Largely used in pre-

paration of dyes and colouring agents, such as methylene blue, eosine, fuchsine, rosaniline and coralline. It will be remembered that it is from the base aniline that acetanilide or "antifebrin," monobromacetanilide or "antisepsin," and methylacetanilide or "exalgin" are derived.

How taken.—Vapour inhaled in cleaning out a vat. Fumes inhaled from a broken carboy. Used for dyeing articles of clothing, such as socks, lining of gloves, &c., and may produce an intense form of inflammation and vesication of the skin which is rebellious to treatment and liable to relapse for many months after the original attack has subsided. Toxic effect of some red aniline dyes probably due to presence of arsenic as an impurity. Used in aniline treatment of consumption, which consists of inhalation of one part of aniline and seven of eucalyptus oil or some other essential oil. Also employed to colour confectionery and cosmetics. One ounce of auramine will colour two thousand pounds of sugar candy a beautiful yellow colour. Cyanosis in newly born children caused by use of napkins marked with aniline ink. Sucking aniline pencil.

Symptoms.—Similar to those produced by

nitro-benzol. Nausea and vomiting, giddiness, apparent intoxication, drowsiness, profuse sweating, the surface of the body remaining cold, face, lips, mucous membrane of the mouth, and fingers of a deep blue colour. Breathing, gasping, smell of aniline in the breath. Sufferer looks like a patient in last stage of Asiatic cholera. Workers in aniline often suffer from bronchitis and a violent dry spasmodic cough. Piece of aniline pencil in eye coloured conjunctiva bright violet, and gave rise to much inflammation with intense pain and photophobia.

Fatal dose.—Six fluid drachms.

Treatment.—Removal of cause, fresh air, stimulants, artificial respiration, inhalation of oxygen, bleeding or transfusion.

Tests.—Aniline may be separated from organic mixtures by rendering acid with caustic potash and then distilling. By the addition of sulphuric acid it is converted into the sulphate, and on adding a solution of bleaching powder a purple colour is produced changing to a reddish brown.

ANTIFEBRIN—ACETANILIDE.

Crystalline substance almost insoluble in water, soluble in alcohol. Used as an antipyretic. Caution should be exercised in prescribing this drug as it sometimes induces unexpected effects. The symptoms recorded are the following:—A feeling of fatigue, faintness and anxiety. Nausea, vomiting, and purging. Pulse weak and thready, respiration at first hurried, then impaired and laboured. Lividity, cyanosis, and sweating. Tremors, convulsive movements and collapse. The following cases serve to illustrate the toxic effects produced by the drug:—

Healthy young woman took a tea-spoonful in water and repeated it in ten minutes. Becoming alarmed took an emetic and vomited. In a few minutes giddiness, singing in the ears, throbbing in the temples and dull pain in the head. Four hours later face livid, lips blue, pupils contracted, mental condition unaffected. Followed by symptoms of collapse, pulse too feeble to be counted, breathing shallow and every appearance of speedy dis-

solution. For three and a half hours condition critical and not out of danger for fourteen hours.

After ten grains profuse perspiration, weak pulse, dilated pupils, shallow respiration and collapse. Improvement in one hour under treatment. Girl of 13, two doses, 4 grains each, blue in face, faintness, palpitation, prostration. See also *Brit. Med. Jour.*, July 25, 1896.

Patient took $\frac{4}{5}$ gr. three times in an hour or $2\frac{2}{5}$ grs. Cyanosis, palpitation, diplopia and feeling of anxiety.

Symptoms resemble those of aniline poisoning.

Dose.—Recovery from 340 grains.

Treatment.—Emetic. Recumbent position. Stimulants. Inhalation of ether. Hypodermic injection of brandy. Warmth to extremities.

ANTIMONY—TARTARATED ANTIMONY, TARTAR EMETIC.

Antimony wine contains two grains of tartar emetic to the ounce.

How taken.—Mistaken for Epsom salts, also for carbonate of sodium. Overdose when given

for medicinal purposes, murder, secret poisoning. External application in form of ointment (the strength of the Pharmacopœial ointment is one in five) may cause death.

Symptoms.—Metallic taste in mouth, nausea, incessant vomiting, burning heat, and constriction or choking in the throat, difficulty in swallowing, soreness of mouth and throat, with peeling off of mucous membrane, pain in stomach, violent purging. May be thirst with increased flow of saliva. Cramps in arms and legs, coldness of surface with clammy perspiration, congestion of head and face, great depression, faintness, pulse very weak, respirations short and painful, collapse, death. Sometimes either purging or vomiting absent. Sometimes tetanic spasm and sometimes pustular rash on skin like small-pox.

Diagnosis.—May be mistaken for natural disease; *e.g.*, ulcer of stomach or cholera, or may be confounded with arsenic poisoning. Never suppression of urine as in poisoning by arsenic. With antimony, when only one large dose is taken, case proceeds either to death rapidly or recovery. Must be remembered that antimony is sometimes contaminated with arsenic, and this may make diagnosis more

difficult. Testing urine and vomited matter for antimony would distinguish it from natural disease.

Fatal Dose.—Much depends on early occurrence of vomiting. In an adult from ten to twenty grains of tartar emetic would probably prove fatal—a smaller quantity if given in divided doses—but recovery is recorded after half an ounce had been taken. Three quarters of a grain proved fatal to a child. Prognosis on the whole good, if treatment prompt.

Treatment.—1. In those rare cases where there is not vomiting, give an **Emetic** of apomorphine (5 minims of the 1 in 50 solution hypodermically), mustard (a table-spoonful of the powder in water), sulphate of zinc (a scruple in water), or ipecacuanha wine (an ounce in water). Copious draughts of tepid water to promote vomiting always useful.

2. **Tannic or gallic acid.** Give half a drachm of tannic or gallic acid in water, repeating it as often as rejected. Decoction of oak bark will do as well.

3. **Tea or coffee.** Give large doses of strong tea or coffee.

4. Give white of egg, barley-water, arrowroot water, or milk.

5. **Stimulants.** Give stimulants if much collapse.

6. Wrap the patient in warm blankets, and put hot water bottles to the feet.

7. **Morphine.** Give a hypodermic injection of gr. ½ of morphine when the acute symptoms have subsided.

Tests.—Tests for antimony numerous and characteristic. Orange precipitate of sulphide with sulphuretted hydrogen in acid solutions. Same precipitate with ammonium sulphide in alkaline solutions. Place a small quantity of solution in a platinum dish, insert a piece of zinc when a black stain (which must be further identified) will be formed at point of contact. Other special tests are Marsh's, Reinsch's, and Hoffmann's.

ANTIPYRIN.
PHENAZONE—ANALGESINE.

Phenazone is the pharmacopœial name of this substance but the popular term antipyrin is still in common use.

How taken.—Given medicinally for the relief of headache, neuralgia, sea-sickness, &c. Very

popular with the public and usually taken by them without any particular reference to the dose or frequency of administration. Should be used with great caution.

Symptoms.—After small doses may get epigastric pain, nausea and vomiting followed by weakness of the pulse, hurried respiration and cyanosis. In some cases persistent sneezing with lachrymation and flow of mucus from the nose. After larger doses headache, vertigo, yawning and drowsiness, loss of memory, confusion of ideas and deafness. In several cases prompt collapse has followed the administration of large doses of the drug. Even small doses may induce itching of the inner side of the thighs followed by a crop of urticaria which gradually extends over the abdomen.

Treatment.—Keep the patient in the recumbent position and give stimulants. The inhalation of pure oxygen gas may prove useful.

AQUA FORTIS.

See Nitric Acid.

AQUA TOFANA.

A deadly poison made and sold by the iniquitous Tofana or Tophiania, who is supposed to have poisoned with it more than six hundred people, including two popes, Pius III. and Clement IV. The *Acquetta di Napoli* was probably a solution of arsenious acid of uncertain strength. The *Acquetta di Perugia* was prepared by rubbing white arsenic into the flesh of a pig, and collecting the liquid which drained from it. The *Aqua Tofana* was made in the same way, with the addition of the juice of the ivy-leaved broad flax (*Linaria cymbalaria*). From four to six drops were sufficient to destroy life, but it was asserted that the dose could be so proportioned as only to operate fatally within a certain time. The "aqua tofana" continued to be manufactured at Naples, and distributed through Italy for many years after the death of its originator. It was used by Hieronyma Spara, an old fortune-teller, who was the president of a society of young married women whose diversion it was to poison their own and other women's

husbands. Marie de Brinviller's poison was arsenic dissolved in *aqua cymbalaria*, which in itself is certainly not poisonous. Arsenic was undoubtedly the active principle of the *poudre de succession* or "inheritance powder" in which the two female prisoners, La Vigoreux and La Voison, carried on so large a traffic. Compare PTOMAINES (p. 43).

The modern method of poisoning by arsenic is well illustrated by the following account:—"Experiments were then made by one of the prisoners, which resulted in the preparation of the arsenic in the following manner. A number of fly papers were purchased, the price being, it is said, one shilling for sixteen, and these were placed on a soup plate, one by one, layer by layer, and as they were so placed a small quantity of boiling water, just sufficient to thoroughly saturate the papers, was poured upon them. The papers were allowed to stand for a few hours, and were then taken out singly, each one being well squeezed so as to extract all the moisture therefrom. The liquid remaining, which was almost colourless, but which probably contained from eight to twelve or even sixteen grains of arsenic, was poured into a bottle, and the mixture was then ready for its diabolical use."

ARSENIC—ARSENIOUS ACID—WHITE ARSENIC (Acute Poisoning).

How taken.—A common and popular poison. By law not allowed to be sold in small quantities, unless coloured with soot or indigo, but frequently evaded. Very little if any taste, so may be administered in any article of food without difficulty. Fowler's solution—liquor arsenicalis (1 in 100)—is flavoured with compound tincture of lavender. Cases of poisoning from grinding arsenic in the mills, also from vapour in copper smelting. A constituent of some vermin killers and rat pastes. Many preparations for destroying weeds are composed almost entirely of arsenic. Used in some "fly killers" and may be washed out of them quite easily. Used as a "cleansing liquid" to take fur off boilers and coppers. Used for stuffing birds and animals. Given to horses to improve coat. Wheat often steeped in arsenical solution. Has been mixed with flour by mistake, and has been used to adulterate violet powder. Used to "destroy the nerve" in stopping teeth.

Symptoms.—Usually appear in from a quarter of an hour to an hour. Faintness, depression, burning pain in stomach, nausea, vomiting of brown matter mixed with mucus and streaked with blood. Vomited matter may be green from bile, black from admixture of soot, or blue from indigo. Purging with straining, the matter often mixed with blood. Severe cramps in calves of legs. Sense of constriction with dryness or heat in throat and often intense thirst. Pulse small, frequent, irregular, may be imperceptible. Breathing painful from tenderness of abdomen. Skin cold and clammy. Collapse and death. May be a little tetanus or may be salivation or retention of urine and a rash—eczema arsenicale—may appear on skin. Symptoms usually continuous but may be remissions or even intermissions and then death.

Fatal Dose.—From two to three grains usually fatal, but recovery probable after one grain. In exceptional cases, recovery after very large doses, especially if taken on a full stomach and rejected by early and copious vomiting.

Treatment.—1. **Stomach-tube** or **Emetic** of apomorphine (hypodermic injection of 5

minims of the official solution), or mustard (a table-spoonful of the powder in water), or sulphate of zinc (a scruple in water). To be followed by large draughts of hot greasy water or salt and water to wash out stomach. Most important that the whole of the poison should be removed.

2. **Dialysed iron.** Give freshly prepared sesqui-oxide of iron, made by precipitating tincture of perchloride of iron with carbonate of sodium, and filtering through a handkerchief. It should be given in hot water, and in unlimited quantities, or give **dialysed iron** in ounce doses repeatedly.

3. Give **magnesia** in unlimited quantities, if above not at hand.

4. Give **castor oil,** or common oil, or equal parts of common oil and lime-water, frequently and in large doses.

5. **Stimulants** freely, if much prostration.

6. **Mucilaginous drinks.** Such as white of egg, barley-water, linseed-tea.

7. **Warmth.** Hot blankets, hot bottles to extremities, friction with warm hand.

8. **Morphine.** When the more acute symptoms have subsided, linseed meal poultices to abdomen, and a hypodermic injection of half a grain of morphine.

Tests.—Arsenic may be extracted from organic mixtures by addition of pure hydrochloric acid and distilling when the volatile chloride comes over in the distillate. Arsenious acid easily reduced in glass tube with piece of charcoal (end of a charred match) yielding a metallic substance which must be further tested. In solutions acidulated with hydrochloric acid, arsenious acid gives a pale yellow precipitate with sulphuretted hydrogen. Other special tests are Marsh's, Hoffmann's, and Reinsch's. The last named requires skilful manipulation.

ARUM.

See Lords and Ladies.

ATROPINE.

The active principle of Belladonna. Also found in Datura Stramonium.

How taken.—Eye drops taken by mistake. Overdose given hypodermically for relief of sciatica. Murder. Death from use of atropine ointment to a blistered surface. Strength of

liquor atropinæ sulphatis 1 in 100. Unguentum atropinæ, eight grains to the ounce.

Symptoms.—See BELLADONNA.

Fatal Dose.—Death from two grains, recovery from one grain, also from a grain and a half. Recovery of a child aged two from a grain and of another aged four from half a grain. Prognosis in children good.

Treatment.—1. **Stomach-tube** or **Emetic** of apomorphine (5 minims of the 1 in 50 solution hypodermically), or of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (a scruple in water), or of ipecacuanha wine (two table-spoonfuls in water). The stomach may be washed out freely with tea or tannic acid.

2. **Stimulants** such as brandy, sal volatile, or chloric ether.

3. **Coffee.** An enema of a pint of hot strong coffee.

4. Mustard to the calves of the legs, hot water bottles to the feet, rousing by flicking with a wet towel, alternate hot and cold douche, interrupted current to limbs, &c. Massage.

5. **Pilocarpine.** Hypodermic injection of half a grain of nitrate of pilocarpine (10 minims of a 1 in 20 solution) to be repeated frequently, or two drachms of tincture of jaborandi by mouth or rectum.

6. **Artificial respiration** to be maintained for at least two hours if necessary. Use the catheter if retention.

BAKING POWDERS.

Baking-powders as a rule consist of cream of tartar and bicarbonate of sodium in equivalent proportions with a little dehydrated starch to keep the materials dry and prevent chemical action before they are used. In a case referred to me for report a whole family was seized with symptoms of poisoning after eating a cake made with a certain baking powder. At the inquest one end of the packet was found to consist entirely of oxalic acid, but it was not ascertained how it came there. Possibly the packet was accidently broken by some shop assistant and the contents filled up by the first white powder which came to hand.

BARIUM OR BARYTA.

How taken.—Chloride mistaken for Epsom salts, nitrate mistaken for sulphur. Chloride, nitrate, carbonate and acetate all poisonous. Heart remedy allied in action to digitalis.

Symptoms.—Pain in stomach and bowels, purging, vomiting, face anxious, pulse feeble, breathing short and laboured. May be giddiness, cramp, paralysis, convulsion. Collapse, death.

Fatal Dose.—Death from tea-spoonful of chloride and from drachm of carbonate, but much smaller quantity would probably prove fatal.

Treatment.—1. **Stomach-tube** or **Emetic** of sulphate of zinc (half a drachm in water), or of mustard (a table-spoonful of the powder in water), or of ipecacuanha wine (two table-spoonfuls in water). Apomorphine might be used as an emetic.

2. **Sulphate of sodium** (Glauber's salt), in ounce doses in water or milk; **sulphate of magnesium** (Epsom salts) in ounce doses; or **alum** in drachm doses. Dilute **sulphuric acid** in half drachm doses may be added to

these draughts or may be given alone, freely diluted with water. Sulphate of sodium is probably a true physiological antidote.

5. Wrap patient in warm blankets; hot water bottles or bricks to feet. Stimulants freely if collapse. Hypodermic injection of morphine if much pain after subsidence of acute symptoms.

BATTLE'S VERMIN KILLER.

This is said to contain 23 per cent. of strychnine mixed with sugar, flour or Prussian blue. A fertile source of poisoning. For treatment, see STRYCHNINE.

BATTLEY'S SOLUTION—LIQUOR SEDATIVUS.

A well-known preparation of opium. Is about 50 per cent. stronger than laudanum. For treatment, see OPIUM.

BEE-STINGS.

Bee-stings rarely give rise to much trouble, but the sting of a wasp may prove rapidly

fatal, even in the case of a healthy adult. In one instance a lady aged 23 was stung by a wasp on the neck just below the angle of the jaw. The sting was at once extracted and some ammonia was applied to the wound. In a few minutes she became faint and was assisted to the bed. She complained of choking and of pains over the chest and abdomen. She swallowed some brandy with difficulty. She passed a loose motion and within fifteen minutes was dead. It is not improbable that the poison was introduced direct into a vein.

1. Make the patient lie down and give stimulants freely. Brandy, whiskey and champagne are useful. If swallowing impossible inject with an enema apparatus into the rectum.

2. Extract the sting and apply ammonia, sal volatile, carbonate of sodium, carbonate of potassium, washing soda, or any other alkaline solution.

3. Should this fail, try carbolic acid lotion, a drachm to eight ounces, or carbolised oil (1 in 20). Lint soaked in chloroform or in oil of pennyroyal are popular remedies.

BELLADONNA—DEADLY NIGHT SHADE—DWALE—ATROPA BELLADONNA.

Grows in many parts of Britain on calcareous soil but is scarce. Generally found in shady lanes and under hedges, in neighbourhood of villages and ancient ruins. Rarely met with near London. Berries size of a small cherry, deep central furrow, and when ripe of a shiny black colour.

How taken.—Berries eaten by children; in one case were baked in a pie. Infusion of leaves taken by mistake. Extract substituted for extract of hyoscyamus in pills, also mistaken for extract of taraxacum and for confection of senna. Liniment taken by mistake. Poisonous symptoms from application of plaster.

Symptoms.—Heat and dryness of mouth and throat with suppression of saliva, difficulty in swallowing and great thirst. Face flushed, eyes prominent and sparkling, indistinct or double vision, pupils widely dilated and insensible to light. Great excitement, noisy

delirium, patient often thinking that he has to start on a journey. Muscular power weakened, gait unsteady and staggering. Frequent desire to pass water with inability to do so. Skin dry, with perhaps a rash like scarlet fever. Deep sleep, recovery.

Diagnosis.—May be confounded with poisoning by stramonium or hyoscyamus, but of no consequence as treatment the same. Has been mistaken for delirium tremens or acute mania.

Fatal Dose.—Death from drachm of liniment; recovery from half an ounce. Recovery after three drachms of extract. Recovery after eating fifty berries. Prognosis good, majority of cases recover. Children will take almost as much as adults.

Treatment.—1. **Stomach-tube** or **Emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (a scruple in water), or of ipecacuanha wine (two table-spoonfuls in water). Apomorphine may be used as an emetic.

2. **Stimulants** such as brandy, sal volatile or chloric ether.

3. **Coffee.** An enema of a pint of hot strong coffee.

4. Mustard to the calves of the legs, hot-water bottles to the feet, rousing by flicking with a wet towel, alternate hot and cold douche, interrupted current to limbs, &c.

5. **Pilocarpine.** Hypodermic injection of half a grain of nitrate of pilocarpine (10 minims of the 1 in 20 solution) to be repeated if necessary, or two drachms of tincture of jaborandi by mouth or rectum. Pilocarpine is a much less powerful alkaloid than atropine, and an overdose is not likely to do any harm.

6. **Artificial respiration,** to be maintained for two hours if necessary. Catheter to be used if retention.

7. In a bad case or in the absence of pilocarpine, a hypodermic injection of morphine, or of physostigmine would be justifiable. Atropine antagonises physostigmine, but the exact value of physostigmine in poisoning by atropine has yet to be determined.

Tests.—Pharmacological tests of more importance than the chemical. Solution of red iodide of mercury in excess of red iodide of potassium will precipitate atropine from even dilute solutions. Action of solution of alkaloid on pupil and on frog's heart reliable. May be confounded with some of the other tropines, but group test generally sufficient.

BENZIN—BENZOL.

Colourless volatile liquid hydrocarbon made by distillation and rectification of coal naphtha. Insoluble in water. Odour and inflammability sufficient to identify it.

How taken.—Never intentionally. Vapour inhaled by accident in gas-tar distillery. Taken in mistake for *vodka*. Used in dyeing and for cleaning purposes. Often used as a cough medicine mixed with olive oil and oil of peppermint.

Symptoms.—Active poison. Vapour acts as a narcotic, and also produces certain nervous symptoms. Noises in the head, convulsive trembling, twitchings of muscles, convulsions, difficulty in breathing. Taken internally may give rise to dilated pupils, trismus, irregular stertorous breathing, coldness of the extremities, paraplegia, distension of the abdomen and death.

People engaged in dyeing and cleaning suffer severely from headache, vertigo, dizziness and intoxication. In case of workmen employed in distilling benzine, pulse accelerated but regular, skin hot, eyes bright, face animated,

gums marked with blackish line. Breath emits odour of the drug. If action prolonged, intoxication which may go on to delirium, patient talks incessantly, speech embarrassed and halting. Marked loss of sexual power. Epileptiform attacks followed by aphonia and mental disturbance. Coma, paralysis and disturbance of sensibility.

Fatal Dose.—Death in 17 hours from taking three drachms.

Treatment.—1. **Stomach-tube** or **Emetic** of mustard (a table-spoonful in water), or of sulphate of zinc (twenty grains in water), or of ipecacuanha (a scruple of the powder in water). If vapour inhaled stomach pump or emetic useless.

2. **Artificial respiration** to be steadily maintained. Patient to be exposed to current of fresh air—very important. Inhalation of oxygen gas.

3. **Douche.** Alterate hot and cold douche, the water being poured over the chest, from a height.

4. **Stimulants.** Such as brandy, liquor ammoniæ (half a drachm in plenty of water), sal volatile (a drachm in water), or chloric ether (half a drachm in water) frequently re-

peated. If patient cannot swallow, to be given as enema, or brandy may be injected under the skin. Inhalations of ammonia on a pocket handkerchief.

5. **Atropine.** Hypodermic injection of gr. $\frac{1}{50}$ of atropine (2 minims of the solution), or 30 drops of tincture of belladonna given by mouth in water.

6. **Battery.** Mild interrupted current to chest-walls, and over region of the heart.

BICHLORIDE OF METHYLENE.

Used as an anæsthetic. Probably not a simple substance. Physiological effects similar to those of a mixture of chloroform, ether and alcohol. Better to make a mixture at the time in the following proportion :—

A. Alcohol, 1 part.
C. Chloroform, 2 parts.
E. Ether, 3 parts.

A.C.E.

Produces anæsthesia quickly, but not very safe. Probably a better plan would be to put patient under chloroform and then give ether. If dangerous symptoms from Bichloride of Methylene treat as for CHLOROFORM.

BICHROMATE OF POTASSIUM.

How taken.—Accident; suicide. Extensively used in the arts, especially by dyers. Recommended by Prof. T. R. Fraser in treatment of various gastric disorders in doses of from $\frac{1}{12}$ to $\frac{1}{6}$ grain.

Symptoms.—Powerful irritant poison. Acute pain in abdomen. Constant and violent vomiting and purging. Pupils dilated. Violent cramps in legs. General depression often very great, pulse weak, skin covered with clammy perspiration. Urine suppressed or passed in small quantity.

Workmen engaged in the manufactory suffer from bitter nauseous taste in mouth, irritation of mucous membrane of nose, incessant sneezing, increased secretion of tears, and even severe inflammation of eyes. Chronic sores on hands, feet and shoulders. Attacks of conjunctivitis not uncommon. Acts as a caustic when there is the slightest abrasion of the skin. Eruptions similar to eczema or psoriasis are often produced and there may be ulcers having somewhat the appearance of hard chancres. May in time lead to destruction

of septum of nose, for which it seems to have a special affinity.

Fatal Dose.—Two drachms fatal in four hours, but recovery from half an ounce. Severe symptoms from merely tasting a solution of it.

Treatment.—1. **Stomach-tube** or **Emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (a scruple in water), or of ipecacuanha (twenty grains in water).

2. **Carbonate of magnesium** or **chalk** in milk, or white of egg in milk or in water.

3. **Barley water,** arrowroot or thick gruel.

4. Warmth to extremities, stimulants freely if much collapse, hypodermic injection of morphine to allay pain.

BISMUTH.

Nitrate used as a face powder under name of "Pearl white." Dose of two drachms proved fatal. Symptoms were a strong metallic taste in the mouth, burning pain in the throat, vomiting and purging, and spasms of the arms and legs. At the autopsy the

throat, windpipe and gullet were found to be inflamed, and there was inflammatory redness of the mucous membrane of the stomach and the whole of the intestinal tract. Interesting as an illustration of the fact that a substance insoluble in water may give rise to symptoms of poisoning. In another case a subnitrate of bismuth dressing applied to an extensive burn caused somewhat similar symptoms. The throat became sore, a false membrane of white colour formed on the uvula, palate and tonsils, and the edge of the gums of the lower jaw was rough and of a darkish hue. A few days later there was gangrene of the whole palate and the breath was curiously offensive. The teeth became loose, there was pain along the course of the œsophagus, and diarrhœa and vomiting were persistent. The symptoms subsided on discontinuing the dressing. It is usually said that the poisonous effects are due to the presence of arsenic as an impurity, but in last case bismuth was tested and found to be pure. It was detected both in the urine and fæces. The "Bismuth breath" resembling the odour of garlic which is met with in a certain proportion of people taking bismuth is probably due to the presence of a trace of tellurium. For treatment, see ARSENIC.

BITTER ALMOND WATER.

Twenty drops might give rise to dangerous symptoms. For treatment, see PRUSSIC ACID.

BLACK DROP.

An old fashioned preparation of opium. Said to be three or four times as strong as the tincture. For treatment, see OPIUM.

BLUE VITRIOL, BLUE STONE OR BLUE COPPERAS.

This is sulphate of copper. For treatment, see COPPER.

BROMIDE OF POTASSIUM.

The custom has sprung up of late of regarding the salt as a lethal agent and of speaking of 75 grains as being likely to cause death. The scare seems to have originated in a case published in a Journal issued by a

Society of Inebriates in Connecticut. I have looked into the matter and do not believe in it. It would require more definite evidence than that to make one believe that death is likely to follow the administration of bromide of potassium or of any of the bromides.

BRUCINE.

An alkaloid found both in Nux Vomica (*Strychnos Nux Vomica*) and St. Ignatius Bean (*Strychnos Ignatia*). The treatment is the same as for STRYCHNINE.

BRYONY. (BRYONIA DIOICA).

Grows wild in the hedges all over the country. Red berries attractive in appearance and sometimes eaten by children.

Symptoms.—Giddiness, delirium, vomiting, diarrhœa with watery motions, dilated pupils, coma.

Treatment.—1. **Emetic** of mustard, salt, sulphate of zinc or ipecacuanha.

2. **Stimulants,** brandy, chloric ether and sal volatile freely.

BURNETT'S FLUID.

This is a solution of impure chloride of zinc and contains about 220 grains to the ounce. Used as disinfectant. Mistaken for fluid magnesia, for Friedrichshall water, also for pale ale. Death from a mouthful, recovery from half an ounce.

Tests.—Nitrate of silver gives a white precipitate. Ammonia gives a white precipitate soluble in excess and reprecipitated by sulphuretted hydrogen. Sulphide of ammonium gives in neutral or alkaline solutions a white precipitate. Ferrocyanide of potassium gives a white gelatinous precipitate—a very delicate test.

BUTLER'S VERMIN KILLER.

It is said to contain about 5 per cent. of strychnine mixed with flour and soot, or sometimes Prussian blue. Sixpenny packet weighs about a drachm, and contains from two to three grains of strychnine. For treatment, see STRYCHNINE.

CAFFEINE.

There are three salts in common use, the citrate, hydrobromate and valerianate. Case of poisoning by a drachm of the citrate given in mistake for the effervescing salt. Recovery after taking 200 grains.

Symptoms.—Burning pain in throat and gullet, giddiness, faintness, nausea, numbness, pain and tenderness in abdomen, great thirst, dry tongue. Tremors of extremities, diuresis, weak pulse, cold skin, collapse. Recovery under treatment.

Treatment.—1. **Emetic** of mustard, carbonate of ammonium, ipecacuanha or salt.

2. **Stimulants.** To be given freely. Brandy half a pint or more, champagne, sal volatile, spirits of chloroform, etc. Friction with warm hand. Warmth to extremities. Massage.

3. **Morphine and Atropine.** Hypodermic injection of morphine half a grain, with atropine one-sixteenth of a grain.

CAMPHINE.

This is oil of turpentine purified by distillation with lime. For symptoms and treatment, see TURPENTINE.

CAMPHOR.

How taken.—Given to children to play with. Popular remedy for many complaints – in solution for cold in the head, in solid form as a vermifuge. Essence of camphor or Rubini's solution is a saturated solution in alcohol, and is largely used in treatment of summer diarrhœa. Spirits of camphor 1 in 10. Camphorated oil or camphor liniment 1 in 5.

Symptoms.—Odour of breath, languor, giddiness, faintness, disturbance of vision, noises in the ears, delirium, convulsions, especially in children, shrunken features, coldness of the surface, clamminess of the skin. Sometimes smarting and pain in urinary organs with desire to pass water. Pulse quick and weak, breathing difficult; but no pain, no purging, no vomiting. Recovery may be preceded by long sleep with copious sweating.

Fatal dose.—Frequently gives rise to alarming symptoms, but rarely fatal. Death in a child from a piece the size of a nut. Recovery in different cases from 20, 25, 160, and 200 grains, but dangerous symptoms from even fifteen minims of the strong solution.

Treatment.—1. **Stomach-tube** or **Emetic** of apomorphine (5 minims of the 1 in 50 solution hypodermically), or of mustard (a tablespoonful of the powder in water), or of sulphate of zinc (a scruple in water), or of ipecacuanha (twenty grains in water).

2. **Stimulants** freely—sal volatile or ether to inhale, or brandy injected under skin. If camphor taken in solid form not wise to give spirits by mouth.

3. **Warmth** to the extremities by hot blankets, hot-water bottles, etc. Rubbing with the warm hand, and with brandy. Massage.

4. **Douche.** Alternate hot and cold douche to head and chest.

CANTHARIDES—SPANISH FLY—BLISTER BEETLE.

How taken.—To procure abortion. As an aphrodisiac. Given as a "joke." Powder mistaken for jalap, used instead of pepper. Death from use of ointment in mistake for sulphur ointment.

Symptoms.—Burning sensation in throat and

stomach, with pain and difficulty in swallowing. Vomiting of mucus mixed with blood—may contain shining particle of the powder. Diarrhœa, motions consisting of blood and slime. Salivation and swelling of the salivary glands. Incessant desire to pass water, but only a little blood or albuminous urine passed at each attempt (characteristic symptom). Peritonitis, high temperature, quick pulse, headache, loss of sensibility, convulsions, death.

Fatal dose.—Recovery from two drachms of the powder, death from twenty-four grains, also from an ounce. Recovery from six drachms of the tincture, in one case recovery from an ounce, in another death. The tincture varies much in activity. Sometimes the insects are exhausted with spirit, and then dried and sold again.

Treatment.—1. **Stomach-tube** if seen at once and condition of throat will admit of its use. If not, **Emetic** of apomorphine (5 minims of the 1 in 50 solution hypodermically), or of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (a scruple in water), or of ipecacuanha (twenty grains or more).

2. **Demulcent drinks.** Barley-water, thick gum and water, or white of egg and water, gruel, linseed tea. Not oil in any form.

3. **Morphine.** If much pain thirty minims of laudanum by mouth or half a grain of morphine hypodermically. If much diarrhœa and straining a half grain morphine suppository.

4. Hot baths or linseed meal poultices to the abdomen, when the more acute symptoms have subsided.

CARBOLIC ACID—PHENIC ACID—PHENOL.

How taken.—Favourite for suicidal purposes. Lotion administered by mistake for medicine. Too strong an injection ordered. Disinfectant. Antiseptic dressing. Spray. Rubbed into the skin to cure itch, and other skin diseases. Carbolic oil given instead of castor oil. Death from application in cancer of the womb. Injected into rectum to cure worms.

Symptoms.—Intense burning sensation extending from mouth to stomach coming on at once, even in act of swallowing, lips and

mouth white and hardened. Skin cold and clammy; lips, eyelids and ears livid. Pupils contracted. Urine dark in colour, even black, or may be suppressed. Insensibility, coma, stertorous breathing, complete abolition of reflex movements, respiration hurried and shallow, death. May be great improvement with return of consciousness, and then after some hours death suddenly from collapse.

Fatal dose.—Minimum fatal dose one drachm, but sometimes recovery from taking this quantity. Half an ounce almost invariably fatal. Prognosis grave.

Treatment.—1. **Epsom salts.** Give half an ounce of sulphate of magnesium (**Epsom salts**) or half an ounce of sulphate of sodium (**Glauber's Salts**) in half a pint or more of warm water. Soluble sulphates form sulphocarbolates in the blood which are harmless.

2. **Stomach tube** or **Emetic** of apomorphine (hypodermic injection of 5 minims of 1 in 50 solution), or of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (a scruple in water), or of ipecacuhana.

3. Wash out the stomach with **Epsom Salts** or **Glauber's Salts** or **Soda,** or with **saccharated lime** dissolved in large quantities of

tepid water, until the smell of the acid is no longer perceived. Leave the stomach full of the solution so that it may be absorbed.

4. **White of egg** in water in large quantities.

5. Give an ounce of **castor oil** or half a tumblerful of olive oil.

6. Give **stimulants** freely; hot brandy and water, chloric ether, and sal volatile.

7. Apply **warmth** to the extremities. Friction with the warm hand. **Interrupted current** to the extremities.

8. **Atropine.** Hypodermic injection of gr. $\frac{1}{50}$ of sulphate of atropine (2 minims of 1 in 100 solution).

9. Inhalations of **nitrite of amyl.**

10. **Bleeding** or **Transfusion** might be resorted to in desperate cases.

Tests.—May be separated from organic mixtures by distillation after addition of sulphuric acid. Gives fine purple colour with ferric chloride and yields white precipitate (tri-bromo-phenol) with bromine water.

Regulations as to sale.—See Appendix.

CARBONIC ACID GAS—CHOKE DAMP—AFTER DAMP.

How taken.—May be accidentally inhaled in many ways, *e.g.*, sleeping in an overcrowded room; cleaning out vats in which fermentation has been going on; sleeping over a lime kiln; gas following explosions in coal mines; in wells or cellars where gas has accumulated from decomposing substances; travelling by under-ground railway. Use of charcoal stoves or even gas stoves if adequate ventilation not provided.

Symptoms.—Irritation of throat, weight and pains in the head, drowsiness, giddiness, singing in the ears, gradual loss of muscular power until the patient falls insensible, his head bowed on chest. Lividity of face and body generally, violent action of heart, hurried respirations, coma, death.

Fatal Dose.—Difficult to say but probably from 10 to 15 per cent. of carbonic acid in the atmosphere would prove fatal. This percentage will usually extinguish a taper. Even

2 per cent. would produce serious symptoms if inhaled for long.

Treatment.—1. Plenty of **fresh air,** open all doors and windows.

2. **Artificial respiration** to be kept up steadily and unceasingly.

3. **Ammonia** to the nostrils. **Friction** and warmth to the extremities. Interrupted current to the limbs.

4. **Stimulants** in moderate quantities. Injection of a pint of hot strong coffee into the rectum.

5. The inhalation of **oxygen** (about two quarts), if obtainable.

6. **Cold douche** to head and chest.

7. **Bleeding** or **Transfusion** might do good.

8. The **catheter** may have to be used in prolonged cases.

CARBONIC OXIDE GAS.

Much more active than Carbonic Acid Gas. So deadly that it kills almost at once. Probably 2 per cent. in the atmosphere would prove fatal. Occurs with Carbonic Acid Gas under circumstances already enumerated.

Water-Gas obtained by passing steam over incandescent carbon, contains about 40 per cent. of carbonic oxide the remainder being chiefly hydrogen. The great objection to its employment for domestic purposes is that it is practically odourless so that no warning is afforded of its escape into a room. This difficulty might be obviated by mixing it with coal-gas or by the addition of mercaptan or some other substance having a powerful odour.

Treatment.—As for CARBONIC ACID GAS.

CAUSTIC POTASH—CAUSTIC SODA.

For symptoms, see POTASH.

Treatment.—1. Give large draughts of water mixed with **vinegar, acetic acid, citric acid, lemon-juice,** or orange-juice.

2. **Demulcent drinks,** such as white of egg (uncooked) and water, milk, gruel, barley-water, etc.

3. **Olive oil** freely.

CESSPOOL GAS—CESSPOOL EMANATIONS.

For treatment, etc., see SEWER GAS.

CHARCOAL FUMES.

For treatment, see CARBONIC ACID GAS.

CHLORAL—CHLORAL HYDRATE.

How taken.—Popular sedative and narcotic. Taken by all classes of society to induce sleep, and as a "restorative." Deaths by injudicious use very frequent. Not uncommonly used for suicidal purposes. Strength of syrup 10 grains in the drachm. Syrup sold under guise of a patent medicine without restriction. If given rapidly accumulates and finally kills, possibly by a sudden paralysis of the heart. Twenty grains is the highest safe dose of chloral, and this should not be repeated oftener than once an hour, and after sixty grains have been taken not for some hours except in urgent cases.

Symptoms.—Deep sleep, loss of muscular power, diminished or abolished reflex action and sensibility. Face livid and bloated, sometimes flushed, pulse either slow or very weak and quick. Diminished frequency of respiration, which is often sighing or stertorous.

Pupils contracted during sleep, but on waking they dilate. Extremities and surface generally very cold, temperature falling as low as 91° F. May be an eruption on skin like urticaria if case prolonged. Death by arrest of respiration or paralysis of the heart. In one case the patient after recovery became idiotic.

Fatal Dose.—Bad symptoms from 10 grains. Death from 20 grains and from 30 grains; recovery from 180 grains also in one case from 460 grains. Two cases of recovery from four ounces of syrup.

Treatment.—1. **Stomach pump** or **Emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (a scruple in water), or of ipecacuanha (twenty grains in water). Apomorphine may be used as an emetic, a hypodermic injection of 5 minims of the 1 in 50 solution, repeated if necessary. Use of stomach-pump may be continued with advantage for half an hour, water at a temperature of 105° F. being introduced freely.

2. Keep up the temperature by **hot blankets** frequently renewed, **hot-water bottles,** hot bricks, **dry friction,** &c. **Massage** of great value and importance.

3. Prevent patient from sleeping, by **rousing** him in every way, by speaking to him sharply, flapping face and chest with wet towel, pinching, mustard to calves of legs, battery to limbs, &c., application of strong ammonia to nostrils.

4. Injection of a pint of hot strong **coffee** into rectum, to be repeated if necessary.

5. In bad cases, hypodermic injection of gr. $\frac{1}{25}$ of nitrate of **strychnine** (2 minims of a 1 in 50 solution), or fifteen minims of tincture of nux vomica by mouth or rectum. It may be repeated if necessary, and improvement in the pulse and temperature is to be taken as an indication that it is doing good. In case in which four ounces of the syrup were taken by a woman, five hypodermic injections, of 4 minims each of liquor strychninæ were given in an hour and ten minutes and she recovered.

6. Inhalations of **nitrite of amyl** from time to time.

7. **Artificial respiration** on slightest sign of failure. To be continued for some hours if necessary.

Tests.—Heated with caustic potash yields chloroform and potassium formiate. Chloroform recognised by its odour, and if chloral solution concentrated by separating as a heavy

layer at the bottom of test tube. An organic mixture containing chloral yields chloroform on distillation after being rendered alkaline with caustic potash.

CHLORAL AND MORPHINE—CHLORAL AND OPIUM.

An unfavourable combination, and one of not infrequent occurrence. It is difficult to keep the patient awake, and at the same time to keep him warm. The condition of the heart has also to be taken into consideration, and it would not be judicious to walk the patient about as in ordinary opium poisoning.

Treatment.—1. **Stomach-pump** or **Emetic** of apomorphine (5 minims of the 1 in 50 solution injected under the skin and repeated if necessary), or of mustard (a table-spoonful or more of the powder in water), or of sulphate of zinc (a scruple in water), or of ipecacuanha (twenty grains in water). The stomach to be thoroughly washed out, coffee being used for the purpose if thought desirable.

2. Rouse the patient by flapping him with a wet towel, &c. **Ammonia** to the nostrils.

Cold douche to the head and chest, followed by warm **douche.**

3. Patient to be kept warm by hot blankets frequently renewed, hot-water bottles, hot bricks, dry friction, &c.

4. Give a hypodermic injection of gr. $\frac{1}{25}$ of **atropine** (4 minims of a 1 in 100 solution), repeating it in a quarter of an hour if necessary.

5. **Strychnine.** If the symptoms of chloral poisoning predominate, give a hypodermic injection of gr. $\frac{1}{25}$ of nitrate of strychnine (2 minims of 1 in 50 solution), repeating it in half an hour if necessary; or fifteen minims of tincture of nux vomica may be given by mouth or rectum.

6. **Coffee.** Give hot strong coffee, or inject it into the bowel.

7. **Artificial respiration** to be kept up for some hours.

CHLORATE OF POTASSIUM.

Not common. From long continued use may get pain in abdomen, loss of appetite, profuse diarrhœa, dyspnœa, feeble action of

heart. From large doses may get toxic hæmoglobinuria. The patient is seized with a rigor, vomiting and diarrhœa set in, he becomes collapsed and cyanosed, falls into a state of stupor and soon dies.

CHLORIDE OF ZINC.

For treatment, see ZINC.

CHLORINE GAS. (INHALED).

Used as a disinfectant and bleaching agent.

Symptoms.—Irritation of throat, cough, tightness of the chest, difficulty in breathing, inability to swallow.

Treatment.—1. Plenty of **fresh air.**

2. Inhalations of **steam.**

3. Inhalations of very dilute **ammonia** or **sulphuretted hydrogen.**

4. Inhalation of **chloroform** or **ether** to ease the cough.

CHLORODYNE

Is said to consist of chloroform, muriate of morphine (probably about 2½ grains to the

ounce), rectified ether, oil of peppermint, prussic acid, gum acacia and treacle. The tincture of chloroform and morphine of the British Pharmacopœia is an imitation of it and contains in every ten minims, 1¼ minims of chloroform and gr. $\frac{1}{48}$ of hydrochlorate of morphine. For treatment, see OPIUM.

Fatal Dose.—An ounce has proved fatal.

CHLOROFORM. (INHALATION).

Symptoms.—The symptoms are too well known to need enumeration.

Treatment.—1. Pull the **tongue** out with the forceps, and see that the mouth is clear. See that there is no obstruction by artificial teeth.

2. Loosen everything about the chest; flap the face and chest with the end of a wet towel. Open doors and windows so as to have plenty of fresh air. Alternate cold and warm **douche** to chest and head.

3. **Artificial respiration** to be commenced **at once**—not faster than twenty in the minute.

4. Let the head be at a lower level than the

rest of the body. Completely invert the patient for a moment, letting the head rest on the ground.

5. Inhalations of **nitrite of amyl.**

6. **Battery.** Interrupted current, one pole at pit of the stomach and the other over the larynx. To be used cautiously and for a short time only. Strong currents are to be avoided.

7. In apparently hopeless cases two or three violent blows on the chest delivered in quick succession, may restore the heart's action.

8. **Atropine.** Atropine has been recommended on theoretical grounds, but it is not likely to do much good after serious symptoms have set in, it might be tried, however, in doses of 4 minims of 1 in 100 solution hypodermically.

CHLOROFORM. (SWALLOWED).

How taken.—Suicide generally, sometimes by mistake.

Symptoms.—Smell in breath, anxious countenance, burning pain in throat, stomach and over abdomen, coldness of extremities, staggering gait. May be vomiting, insensibility deepening into coma with complete anæsthesia, pupils dilated, breathing stertorous, skin cold, pulse imperceptible.

Fatal Dose.—Death from one ounce, but several cases of recovery after taking two ounces.

Treatment.—1. **Stomach-tube** or **Emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (a scruple in water), or of ipecacuanha (twenty grains in water). Apomorphine may be used as an emetic—5 minims of the 1 in 50 solution hypodermically.

2. Give large draughts of water containing **carbonate of sodium** in solution.

3. Rouse the patient in every way possible. Flicking with wet towel. Mustard to calves of legs and over the heart. Olive oil to relieve the burning pain.

4. Injection of a pint of hot strong **coffee** into the rectum.

5. Inhalations of **nitrite of amyl** frequently.

6. Do not leave the patient for some hours after, for there may be a relapse.

CHROMIC ACID.

Treatment.—1. **Stomach-pump** or **Emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (a scruple in water), or of ipecacuanha wine (a table-spoonful in water).

2. **Carbonate of magnesium,** or chalk in milk, or white of egg in milk, or in water.

3. **Demulcent drinks.** Barley-water, lin-seed tea, arrowroot gruel, &c.

COAL GAS.

How taken.—May be inhaled in various ways, by workmen at gas-works, by gas fitters, as the result of leaky pipes and taps, and perhaps, by gas not being properly turned off at night, and gradually filling the room or house when every one is asleep. Death of five people from bursting of branch pipe leading from the main, and escape of gas into the house during the night. Toxicity probably due in great part to the carbonic oxide it contains.

Symptoms.—Headache and giddiness, loss

of memory and muscular power, unconsciousness, pupils insensible and dilated, breathing laboured, convulsions, coma or asphyxia, death. Smell of gas in the room, and in the patient's breath.

Treatment.—1. Plenty of **fresh air.** Open all doors and windows.

2. **Artificial respiration** to be kept up steadily and incessantly.

3. **Ammonia** to the nostrils. **Friction** and warmth to the extremities. **Mustard** leaf or mustard poultice to calves of legs. **Interrupted current** to extremities. Mustard over the heart.

4. **Stimulants** in moderate quantities by mouth or rectum. Enema of a pint of hot strong **coffee.**

5. The inhalation of **oxygen** with alternate cold and warm **douche** to head and chest.

6. **Bleeding** might do good. In prolonged cases it may be necessary to employ the **catheter.**

COCAINE.

A solution of hydrochlorate of cocaine injected hypodermically or applied to the eye

or a mucous membrane often gives rise to serious symptoms, which not infrequently come on almost instantly. There are evidently curious individual peculiarities in its action, the following symptoms having been noted in different cases:—pallor of the face, faintness, giddiness, paroxysmal dyspnœa, a rapid and weak pulse, nausea and vomiting, intense prostration amounting almost to collapse, pain in the back especially in the lumbar region, tingling all over the body, dryness of the skin, mental excitement, delirium, epileptiform convulsions and spasmodic contraction of the muscles of the arms and legs. Serious symptoms have resulted from half a grain.

The following may be cited as illustrative cases:—

A daily hypodermic injection of thirty-five drops of a 4 per cent. solution with instillation of a few drops of the same solution into the conjunctival sac gave rise to headache, vertigo, nausea, tottering gait, pallor of the skin and cold sweats.

Seven or eight minims of a 4 per cent. solution introduced into the eye of a healthy man produced spasm and loss of consciousness.

In five cases the use of a 4 per cent. solution

in various operations on the eye was followed by headache, vertigo, nausea and vomiting accompanied by delay in the healing of the corneal wound.

From twenty to thirty drops of a 4 per cent. solution applied to the teeth and gums produced faintness and giddiness, palpitation, tingling and numbness, dryness at the back of the throat and a scarlatinal rash all over the body. Twelve minims of a freshly prepared 10 per cent. solution injected under the skin gave rise to syncope, followed by twitchings of the face, falling of the jaw, coldness of the surface, clammy perspiration and lividity of the face—in fact all the symptoms of imminent death. The patient recovered consciousness in a few hours but was prostrate for many hours.

Four and a half grains taken accidentally in solution produced cramp in the stomach, nausea, throbbing in the head, incoherence of speech, confusion of ideas and drowsiness. This was followed by profuse sweating, severe prostration and a feeling of impending death. Cyanosis followed and the pulse was intermittent. These symptoms persisted for eight hours and were followed by tingling and numb-

ness of the fingers which lasted for three or four days.

Three and a half minims of a 20 per cent. solution of cocaine were injected under the skin of a tall strong healthy man aged twenty-nine. In two minutes showed signs of faintness, followed by extreme pallor, yawning, gasping for breath and frequent sighing. The hands were firmly clasped and were separated with difficulty. The extremities were cold and rigid. The face was blue and pinched, the pupils were dilated and inactive to light and the pulse was feeble and rapid. This condition lasted for some minutes and for some time afterwards he was dazed and stupid.

Any dose above one grain applied to a mucous membrane or injected hypodermically may give rise to alarming symptoms.

Fatal Dose.—Death is rare.

A patient suffering from extensive disease of the lungs, kidneys, and bladder, died within an hour after taking a mixture containing 22 grains of cocaine. Recovery after taking 23 grains of cocaine and also after taking 32 grains in three hours. Recovery after the administration of 14 grains hypodermically.

The treatment consists of the administration

of stimulants, ether and brandy for example, and the inhalation of nitrite of amyl. The ether may be given hypodermically in five-minim doses.

COCCULUS INDICUS—ANAMIRTA COCCULUS.

INDIAN BERRY—LEVANT NUT.

See PICROTOXIN.

COLCHICUM—MEADOW SAFFRON—AUTUMN CROCUS—COLCHICUM AUTUMNALE.

How taken.—All parts of the plant poisonous. Wine taken by mistake for sherry and other wines, once mistaken for quinine wine. Given for criminal purposes. Case of poisoning by Blair's Gout Pills, *Lancet*, vol. i., 1881, p. 368.

Symptoms.—Burning pain in stomach, persistent vomiting and purging, the stools being

mixed with blood. Irritation of the throat and intense thirst. Great prostration, pain in head, pinched face, profuse perspiration, dilated pupils, small weak or intermittent quick pulse, muscular twitchings, pain in extremities or perhaps in joints. Mental faculties may be unimpaired, or there may be delirium. Sometimes suppression of urine. Symptoms sometimes not unlike malignant cholera.

Fatal Dose.—Of the wine, death from two ounces, from an ounce and a half, and from an ounce. Recovery from one ounce. In cases of acute gout, I have frequently given drachm doses three times a day for a week with no worse symptoms than a little purging and perhaps vomiting. Of the tincture, death from an ounce and a half, recovery from one ounce.

Treatment.—1. **Stomach-pump** or **Emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (a scruple in water), or of ipecacuanha wine (an ounce in water).

2. Give **tannic** or **gallic acid** in half drachm doses, frequently repeated, or strong tea.

3. **Demulcent drinks,** such as white of egg and water, barley water, arrowroot, &c.

4. **Stimulants,** if signs of collapse, brandy, chloric ether, sal volatile.

5. A hypodermic injection of half a grain of **morphine.**

COLOCYNTH—BITTER APPLE.

How taken.—Powder extensively employed for procuring abortion "as much as will go on a threepenny-bit."

Symptoms.—Persistent vomiting, purging, the motions containing mucus and perhaps blood, exhaustion, cold extremities, weak pulse, collapse, death.

Fatal Dose.—A tea-spoonful and a half have proved fatal.

Treatment.—1. **Stomach-tube** or **Emetic** of mustard and water, sulphate of zinc or ipecacuanha.

2. **Camphor.** Ten drops of spirits of camphor, or three drops of essence of camphor on sugar or in milk every quarter of an hour.

3. **Laudanum.** Thirty minims of laudanum in brandy and water, or if patient unable to swallow, to be mixed with two ounces of starch and water, and injected into the bowel.

Stimulants freely—hot brandy and water, chloric ether, sal volatile, &c.

5. **Demulcent drinks,** white of egg and water, thick gum and water, barley water, arrowroot, &c.

6. **Warmth.**—Patient to be kept warm by hot blanket, hot-water bottles, hot bricks to feet, friction with warm hand, &c. Hot linseed-meal poultices to the abdomen.

CONIUM—HEMLOCK—COMMON OR SPOTTED HEMLOCK.

An indigenous plant found in hedges, easily recognised by its mousey odour.

How taken.—Mistaken for parsley, eaten in salad and in soup. In one case children killed by blowing a whistle made from the twigs.

Symptoms.—Weakness of the legs, faltering gait, staggering as if intoxicated, loss of power in the arms, loss of all voluntary power, pupils dilated and fixed, loss of sight, inability to swallow, paralysis of muscles of respiration, asphyxia, death.

Treatment.—1. **Stomach-pump** or **Emetic** of mustard (a table-spoonful of the powder in

water), or sulphate of zinc (a scruple in water), or ipecacuanha.

2. **Tannic acid** or **gallic acid,** or decoction of oak bark, or strong tea in unlimited quantities, after which the stomach should be again emptied.

3. **Stimulants,** brandy, chloric ether, ammonia, &c.

4. **Warmth** to the extremities by hot-water bottle, hand rubbing, &c.

5. **Artificial respiration,** long continued.

6. The hypodermic injection of gr. $\frac{1}{50}$ of sulphate of **atropine** (2 minims of a 1 in 100 solution) may be tried.

CONVALLARIA MAJALIS—LILY OF THE VALLEY.

Used as a diuretic and remedy for certain forms of heart disease. Common preparations are the extract and fluid extract. They contain two active principles "convallarin" and "convallamarin." Convallarin possesses purgative properties only, whilst convallamarin is a heart poison allied to digitalin, helleborin, and the upas principles. Treatment as for DIGITALIS.

COPPER.

How taken.—Generally as the sulphate or blue stone, or as the subacetate or verdigris. By accident, for purpose of procuring abortion, suicide, murder. Most cases of copper poisoning, however, are from use of copper vessels in cooking. Articles of food, if not acid, may be boiled in clean copper vessels without risk, but food must not be left standing in copper vessel. Much safer to have all copper vessels used for culinary purposes tin-lined. Chronic poisoning may occur in many ways:—used in pickles and preserved peas, to give them a green colour; to colour sweets; lemon-juice kept in copper tanks; use of green wrappers for foods; use of inferior gold for artificial teeth; manufacture of artificial flowers; drugs kept in copper vessels; workers in copper or bronze. Traces of copper sometimes found in aërated waters from use of copper condenser imperfectly lined with tin. Sulphate of copper administered to animals can be detected in the liver and kidneys.

Symptoms.—Metallic taste in mouth, constriction in throat and gullet, griping and colicky pains in the abdomen, nausea and vomiting, purging with much straining, partial suppression of urine, jaundice. Hurried and difficult breathing, small quick pulse, great weakness, intense thirst, cold perspiration, coldness of limbs, headache, giddiness, coma, death.

In cases of chronic copper poisoning a green line on the margin of the gums has been observed, which is indistinguishable from the blue line of lead. Wrist-drop and cramps have also been recorded. It is doubtful if small doses of copper frequently repeated do any harm. Sulphate of copper is an excellent nervine tonic and I often give it in grain doses in a pill three times a day for weeks together without the production of any inconvenience to the patient.

Fatal Dose.—Death from one ounce of verdigris. Recovery from an ounce of sulphate, and also death.

Treatment.—1. Give milk and eggs freely.

2. **Stomach-pump** or **Emetic** of mustard (a table-spoonful) and water, or ipecacuanha. Large draughts of tepid water.

3. Give **barley-water**, or arrowroot, or gruel.

4. Give hypodermic injection of gr. ½ of **morphine,** or twenty-five drops of laudanum by mouth.

5. Apply linseed meal **poultices** to abdomen.

Tests.—Chemical reactions characteristic and simple of application. Deposit of metallic copper from acidified solution on knife-blade or needle or on platinum foil in contact with zinc. With ammonia solution, blue precipitate soluble in excess forming a purple solution. Ferrocyanide of potassium gives chocolate precipitate or light red colouration, characteristic and very delicate.

CORROSIVE SUBLIMATE—PERCHLORIDE OF MERCURY.

Used to kill insects and preserve specimens. Also to preserve timber from dry rot. Has been dispensed in mistake for calomel (the subchloride). Dangerous symptoms from use of antiseptic solution as a surgical dressing, and for washing out cavities. External applications in the form of lotion or ointment may cause death. The liquor contains gr. ½ to the ounce. An extensively advertised "skin

tonic" was found to contain 1·6 grains of corrosive sublimate, and in a case before the Dublin Law Courts it was shown to have produced symptoms of mercurial poisoning.

Symptoms.—Lips and mouth white and swollen. Metallic taste in the mouth, sense of constriction in throat extending to stomach. Great pain in stomach. Nausea with vomiting of stringy masses of white mucus mixed with blood. Profuse purging, evacuations mucous in character and streaked with blood. Countenance may be swollen and flushed, or pale and anxious. Pulse small, frequent, and irregular. Tongue white and shrivelled. Skin cold and clammy and respiration difficult. Suppression of urine; syncope; convulsions; death.

Employed as an antiseptic dressing may be followed by diarrhœa, at first watery, then blood stained, tenesmus, pains in the rectum, abdominal colic, nausea and vomiting. Urine contains albumin, epithelial cells and granular casts. Slight disturbance of intellect and insomnia. If fatal termination, intelligence remains intact, but sight becomes dim, pulse is weaker, pupils are contracted, temperature falls, and erythema appears in a pronounced form.

Fatal Dose.—Probably from 3 to 5 grains, but recovery from even an ounce when taken on a full stomach and copious vomiting promptly induced.

Treatment.—1. **White of egg** (unboiled), mixed with water, to be given in unlimited quantities. Flour and water, arrowroot, or gruel, if at hand. Barley water. The albuminate of mercury so formed must be removed from the stomach as soon as possible as it is soluble in excess of albumin and may be absorbed.

2. **Stomach-pump** or **Emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (a scruple in water), or ipecacuanha. Apomorphine may be used as an emetic.

3. **Stimulants** if much depression.

CRAYONS—COLOURED CRAYONS—FRENCH CHALKS.

Many very poisonous. Often contain white lead covered with some vegetable substance. Some consist of Prussian blue mixed with Dutch pink. Some probably contain chromium. Arsenic common in cheaper kinds of artist's colours and crayons. Are sucked by children with avidity, and sometimes eaten by them in mistake for sweets.

Symptoms.—Vary with composition of the crayon and the quantity taken, but usually purging, vomiting, and intense thirst, with perhaps convulsions and death.

Treatment.—Much will depend on symptoms. But safe to give an **emetic** of sulphate of zinc, or mustard and water, and to follow this with half a tumblerful of dialysed iron in water.

CREASOTE.

Treatment as for CARBOLIC ACID.

CROTON OIL.

How taken.—Taken by mistake for castor oil. Liniment taken by mistake. Bad effects even from inhaling dust from seeds.

Symptoms.—Intense pain in abdomen. Vomiting, purging, the stools being watery in character. Pale face, pinched features, small thready pulse, moist skin, collapse, death.

Fatal Dose.—From 15 to 20 minims might prove fatal, but recovery from half a drachm or more.

Treatment.—1. **Stomach-pump** or **Emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (a scruple in water), or of ipecacuanha.

2. **Demulcent drinks** to be given freely. Barley water, white of egg and water, gruel, arrowroot.

3. **Camphor.** Three drops of the essence, or ten drops of the spirits, on sugar or in milk every ten minutes to the extent of five or six doses.

4. **Stimulants** freely, brandy, sal volatile, chloric ether.

5. A hypodermic injection of gr. $\frac{1}{2}$ of **morphine,** or twenty minims of laudanum by mouth, to be repeated in an hour if necessary.

6. Linseed meal **poultices** to abdomen.

CURARI—WOORARA—URARI.

For origin and mode of preparation see abstract of Schomburgk's paper in *London Medical Record*, 1880, p. 168. See also Woodman and Tidy, p. 326, and *Popular Encyclopædia*, vol. ii., p. 676.

Several roots and barks enter into its composition, *e.g.*, the bark of *Strychnos toxifera*, *Strychnos Schomburgkii* and *Strychnos cogens*.

General symptoms quite unlike those of poisoning by strychnine, never any tetanus. Paralyses motor nerves and causes death by arresting respiratory movements.

Treatment.—1. **Artificial respiration** to be kept up steadily until the poison is eliminated.

2. **Stimulants** freely; brandy, hot gin and water, sal volatile, chloric ether, &c.

3. If surface wound, through which the poison has been introduced, apply a **ligature** tightly above it, and wash the wound thoroughly. When the symptoms have subsided, the ligature may be cautiously loosened for a moment and then quickly reapplied. This should be done several times, at intervals, so as to allow only a small quantity of the poison to pass into the system each time.

4. The surface of the wound should be thoroughly and repeatedly washed.

CYANIDE OF POTASSIUM.

Used in photography, electro-gilding and silvering, also to clean lace. Purposes of suicide. Two and a half grains equivalent to one grain of anhydrous prussic acid, or fifty minims of B.P. solution.

Symptoms.—Appear at once. Severe burning pain in stomach, foaming at mouth, loss of power in limbs, insensibility, spasmodic breathing, convulsions, tetanic stiffness of jaws and body, and death rapidly.

Fatal Dose.—Five grains usually fatal.

Treatment.—1. Large draughts of **sulphate of iron** (green vitriol) and water, to be taken at once.

2. **Stomach-pump** or **Emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (a scruple in water), or of ipecacuanha.

3. Give **stimulants,** such as brandy, liquor ammoniæ (half a drachm in water), sal volatile (a drachm in water), or chloric ether (half a drachm in water), frequently repeated. If patient cannot swallow, to be given in an

enema, or brandy may be injected under the skin. Inhalations of ammonia on a pocket handkerchief should be tried.

4. Alternate hot and cold **douche,** the water being poured over the chest from a height.

5. Hypodermic injection of atropine, gr. $\frac{1}{50}$ (2 minims of the 1 in 100 solution), or tincture of belladonna internally (30 drops in water).

6. **Artificial respiration** (20 in the minute) to be maintained for an hour or more.

7. **Battery.** Mild interrupted current to chest walls, and over heart.

DALBY'S CARMINATIVE.

The composition of this preparation is said to be:—Carbonate of magnesium forty grains, oil of peppermint one minim, oil of nutmeg two minims, oil of aniseed three minims, laudanum five minims, spirit of pennyroyal and tincture of asafœtida of each fifteen minims, tincture of castor and compound tincture of castor of each thirty minims, and peppermint water two ounces. A tea-spoonful

contains one sixty-fourth of a grain of opium, or about $\frac{1}{4}$ minim of laudanum.

Death from forty drops given to the infant.

The treatment is as for OPIUM poisoning.

DATURINE

Is in all probability a mixture of atropine and hyoscyamine.

DEADLY NIGHTSHADE—ATROPA BELLADONNA.

For symptoms and treatment, see BELLADONNA.

Often confounded with Woody Nightshade or Bitter Sweet (*Solanum dulcamara*) which has a purple flower and red berries, and with the Garden Nightshade (*Solanum nigrum*) which has a white flower and black berries. Medical witnesses and coroners often wrong on this point. If in doubt refer to plates in Bentley and Trimen, or Stephenson and Churchill.

DIGITALIS—FOXGLOVE—DIGITALIS PURPUREA.

How taken.—Mistaken for other drugs. Given ignorantly by quacks. Murder. Infusion has been recommended for spermatorrhœa, this might throw light on an otherwise obscure case. Case of poisoning from taking pills of digitalis furnished with a slowly soluble coating.

Symptoms.—Purging with severe pain in abdomen. Vomiting, vomited matter having a grass-green colour. Pulse slow, small, irregular, and infrequent. Headache, lethargy followed by delirium and convulsions. Pupils dilated, insensible to light, skin cold, pallid, covered with sweat. Urine suppressed. Coma and death quite suddenly.

Fatal Dose.—A somewhat uncertain poison. Recovery after taking two ounces of the tincture.

Treatment.—1. **Stomach-pump** or **Emetic** of mustard (a table-spoonful in water), or sulphate of zinc (a scruple in water), or ipecacuanha (forty grains in water). Apomorphine may be used as an emetic.

2. Twenty grains of tannic or gallic acid in hot water, repeated frequently, or hot strong tea or coffee.

3. **Stimulants,** such as hot gin or brandy and water, sal volatile, chloric ether injected into rectum if not retained by stomach.

4. A hypodermic injection of gr. $\frac{1}{120}$ of aconitine (2 minims of a 1 in 240 solution), or six minims of the tincture of aconite by mouth or rectum, to be repeated in half an hour if obvious improvement in the heart's action.

5. The **recumbent position** to be strictly maintained for some time after all symptoms have subsided.

Tests.—Pharmacological action on frog's heart characteristic of the group. Best chemical test is to moisten trace of digitalin with sulphuric acid and then apply bromine vapour, when a violet colouration is produced.

DUBOISINE

Is probably identical with hyoscyamine.

One case of poisoning by taking eye drops instead of medicine.

For treatment, see ATROPINE.

EMERALD GREEN—SCHEELE'S GREEN.

An arsenite of copper. Largely employed in the arts and manufactures. Constitutes wholly or in part many green pigments, such as "Mineral Green," "Brunswick Green," and "Vienna Green." Different shades are produced by its admixture with whiting or oxide of zinc. Largely used in wall papers, also to colour artificial flowers, wreaths, tarlatan dresses, wafers, confectionery, and even air balls. Many cases of poisoning from sucking water colours. Many cases of obscure illness have been traced to presence of arsenic in wall papers.

Symptoms.—Those of chronic arsenical poisoning; often very severe, the effects lasting months or even years.

For treatment, see ARSENIC.

EPSOM SALTS.

Sulphate of magnesium is not usually regarded as a toxic agent, but Dr. J. Headley Neale of Leicester has given me the details of

a case in which a boy nearly lost his life from taking an ounce of Epsom salts for constipation. He was deeply cyanosed, the conjunctivæ were congested, the radial pulse could not be felt, the extremities were cold and there was spasmodic contraction of the right arm with pronation of the hand. He recovered in about twelve hours, the treatment being ether and ammonia and strophanthus. Dr. Luff records a somewhat similar case from taking an ounce of sulphate of magnesium, which proved fatal. In Dr. Neale's case the drug was examined by Dr. Wilson Hake and was found to be free from impurity.

ERGOT.

Given to procure abortion. Action on parturient uterus very certain, action on pregnant uterus very uncertain. Epidemics of gangrene from eating bread made with ergotised rye, but rare. Ergotin is a watery extract not an alkaloid. Used hypodermically or in form of pill for arrest of hæmorrhage. Ergotin is very active even in small doses.

Symptoms.—Toxic action slight. Even in ounce doses the fluid extract induces no poi-

sonous symptoms unless patient pregnant. In one case tingling in fingers and feet, cramps in legs, arms and chest, with dizziness and weakness, feeling of coldness all over the body, pupils dilated and pulse small. Retching, vomiting, diarrhœa and increased salivary secretion in some cases. Fatal Case, *Lancet*, 1882, vol. ii., p. 526.

Treatment.—1. **Stomach-pump** or **Emetic** of mustard (a table-spoonful in water), or of sulphate of zinc (a scruple in water), or ipecacuanha (forty grains in water).

2. A purgative of castor oil (an ounce), or of Epsom salts (an ounce in water), or a drop or two of croton oil on the back of the tongue.

3. **Tannic** or **gallic acid** in half drachm doses in water, frequently, or strong tea. To be introduced by the stomach-pump if necessary.

4. **Stimulants**, such as brandy, sal volatile, or chloric ether.

5. Inhalations of **nitrite of amyl**, or a fiftieth of a grain of **nitro-glycerine** by mouth (2 minims of the one per cent. alcoholic solution), repeated every quarter of an hour.

6. **Recumbent position.** Warmth to the extremities.

If threatened abortion from administration of ergot, rest and opium are the best remedies. If symptoms alarming and patient pregnant, the propriety of evacuating the uterus will have to be considered.

ESSENTIAL OIL OF ALMONDS.

Contains from 10 to 15 per cent. of hydrocyanic acid, *i.e.*, is from five to eight times as strong as the Prussic acid of the British Pharmacopœia. Death from 17 drops, recovery after taking four drachms.

For symptoms and treatment, see Prussic Acid.

ESSENTIAL SALT OF LEMONS.

This is an acid oxalate of potassium. For treatment, see Oxalic Acid.

ETHER (Inhalation).

How taken.—Used for anæsthetic purposes. Breaking of a jar of ether in room during night.

As an anæsthetic ether is not well adapted for (1) children, (2) patients with bronchitis, (3) operations by candle-light or when actual cautery has to be used. It often causes laryngeal spasm with violent struggling. Recovery is sometimes followed by excitement which may last for some hours. It is more expensive than chloroform from the larger quantity used and its odour is to many very unpleasant. On the other hand it is less dangerous to life than chloroform, vomiting is less frequent and not so troublesome, and it acts as a stimulant to the heart.

Treatment.—1. Pull the **tongue** well forward, and see that the mouth is clear. See that there is no obstruction by artificial teeth.

2. Commence **artificial respiration** at once, and keep it up for two hours if necessary—not faster than eighteen in the minute. Grasp the base of the patient's chest, squeeze the two sides together, pressing gradually forward with all your weight for about three seconds, then with a push suddenly jerk yourself back.

3. Loosen everything about the chest. Open the doors and windows so as to have plenty of **fresh air.** Alternate cold and warm **douche** to the chest and head.

4. Inhalations of **nitrite of amyl.**

5. **Tracheotomy** may be necessary, but to prove of avail it should be performed early.

6. In apparently hopeless cases, two or three violent blows on the chest, delivered in quick succession, may restore the heart's action.

ETHIDENE DICHLORIDE.

Frequently used as an anæsthetic. Probably not a simple substance. Patient usually rendered nearly unconscious with laughing gas and then the ethidene gradually admitted. Stertorous breathing with dilated pupil, but if air admitted with every third or fourth respiration pupil contracts. Vomiting sometimes but not as a rule. Dreams pleasant, often of rapid travelling or of music. Patient awakes as from a natural sleep, after effects slight. Exerts depressing action on heart and pulse, must be carefully watched.

Treatment.—1. Stop administration.

2. Pull tongue forward with forceps.

3. Artificial respiration, a towel or fan being used to blow away vapour from lips.

4. Head low, legs and lower part of body raised.

EXALGIN—METHYLACETANILIDE.

Very serious symptoms are occasionally recorded from the administration of even small doses of exalgin. The symptoms noticed are: numbness and tingling of the extremities, cyanosis, profuse salivation, vomiting, intense dyspnœa and a feeling of alternate expansion and contraction of the head. Serious symptoms have in different cases followed the administration of ten grains three times a day for ten days; six doses of a grain and a half each in two days; a single dose of five grains; a single dose of three grains. The symptoms in some cases have lasted for from nine to twelve hours, and the condition of the patient has been serious. The treatment consists of the administration of an emetic, the free exhibition of stimulants, both by mouth and hypodermically, and the injection of strychnine. The inhalation of nitrite of amyl has been recommended, but it increases the apparent cyanosis by dilating the blood-vessels. For the salivation, chlorate of potash or any astringent. See ANILINE.

FILIX MAS—MALE SHIELD FERN.

Few cases of poisoning on record. In Naphey's *Modern Medical Therapeutics*, sixth edition, p. 331, there is a prescription in which the dose is given as one and a half *ounces* instead of *drachms*. This is a misprint. Symptoms from taking this draught, vomiting, purging, great pain in abdomen, collapse, and death. In the case of a child $5\frac{1}{2}$ years old two drachms of the liquid extract given in divided dose produced vomiting, somnolence, twitching, in five hours.

FLY POWDER—FLY PAPERS—FLY WATER.

Nearly all contain arsenic. For treatment, see ARSENIC.

FOWLER'S SOLUTION.

This is Liquor Arsenicalis, strength 1 in 100. For treatment, see ARSENIC.

FOXGLOVE—PURPLE FOXGLOVE—DIGITALIS PURPUREA.

Grows wild in almost every county in England. Favourite garden plant.

For treatment, see DIGITALIS.

FRENCH BEANS.

The seeds have sometimes given rise to symptoms of poisoning. The treatment should consist of the administration of an emetic and a purgative. Stimulants with rest and the application of warmth to the abdomen and legs would prove useful. Not a very active poison.

FUNGI.

For treatment, see POISONOUS MUSHROOMS.

GAS (ESCAPE OF, INTO ROOM).

For treatment, see COAL GAS.

GELSEMIUM.

The yellow, wild or Caroline Jasmine, *Gelsemium sempervirens.*

How used.—Alcoholic extract and tincture are official. Active ingredient of several quack remedies, one of the most popular being called the "Electric Febrifuge." Gelsemium often used as a "pain-killer" and to induce abortion. Has been taken by mistake. For table of cases, &c., see author's "Gelseminum as a Toxic Agent," *Lancet*, June 15th and 28th, 1878. For action and uses see *British Medical Journal*, June 5th and 12th, 1880.

Symptoms.—Pain in the brows followed by giddiness, pain in the eyeballs and dimness of sight. Ptosis, the patient being quite unable to open his eyes fully. Diplopia, everything being seen double. Weakness in lower extremities, the patient staggering and swaying from side to side as he walks. Great pain in chest, suffocative spasm, struggling for breath. foaming at mouth, coma and death.

Chronic gelsemiumism is occasionally met

with, the drug being taken for the relief of pain. The usual symptoms are restlessness, emaciation and listlessness. The mind is troubled by vague fears and there are sensory hallucinations. Vision is disturbed and mental decay sets in prematurely.

Fatal Dose.—Minimum fatal dose o liquid extract about two drachms. A drachm of the tincture may he given hourly for three or four hours without producing very marked symptoms.

Treatment.—1. If seen soon after the dose has been taken the **stomach-pump** should be employed or an **emetic** of mustard (a table-spoonful in water) might be given. Should a long interval have elapsed the emetic would be useless and would probably increase the prostration.

2. A hypodermic injection of gr. $\frac{1}{50}$ of **atropine** (2 minims of the 1 in 100 solution) should be given, and repeated in a quarter of an hour if there be failure of respiration. In the absence of atropine, thirty drops of tincture of belladonna may be given by mouth.

3. **Stimulants.** Brandy, chloric ether, sal volatile, may be given if sign of failure of the heart's action.

4. **Artificial respiration** should be kept up steadily for at least three hours.

5. The cold and warm **douche** alternately over both head and chest.

GIBSON'S VERMIN KILLER

Is said to contain about half a grain of strychnine in each powder.

For treatment, see STRYCHNINE.

GODFREY'S CORDIAL.

Said to be a mixture of sassafras, treacle and laudanum. It contains half a grain of opium in the ounce. In five years fifty-six deaths from this compound were recorded. The fatal dose for an infant is about a tea-spoonful.

For treatment, see OPIUM.

HAIR DYES.

Those for darkening the hair have almost all the same composition, and consist of acetate of lead in solution, with sulphur suspended in the fluid. If there are two bottles, one

usually contains ammonia nitrate of silver, and the other pyrogallic acid. If a hair dye is warranted "perfectly harmless" and "free from any injurious substance" it may be taken for granted that it contains lead. Some of these "harmless" solutions contain as much as ten grains of acetate to the ounce. Preparations for making the hair light consist of peroxide of hydrogen.

HEMLOCK—CONIUM.

The common greater or spotted hemlock (*Conium maculatum*) is an indigenous plant which grows wild in almost every climate, by road sides, in hedges and waste places. Flowers in June and July. Frequently confounded with other umbelliferous plants. The lesser Hemlock or Fool's Parsley (*Æthusa cynapium*) has no spots on the stem, and the presence of the beard serves to distinguish it from all other Umbelliferæ. The wild Cicely (*Chærophyllum sylvestre*) has a spotted stem but is covered with hairs. The five-leaved water Hemlock (*Œnanthe phellandrium*) grows in ponds and the stem is not spotted.

For treatment, see CONIUM.

HENBANE—HYOSCYAMUS NIGER.

Grows in waste places, chiefly on dry calcareous soil.

For treatment, see ATROPINE.

HOLLY. (*Ilex aquifolium*).

Bad effects from eating the berries in a few cases, chiefly children. Common symptoms are vomiting, pain in head and abdomen, purging, contraction of pupils, drowsiness, loss of consciousness and collapse. Treatment, hot water to facilitate the vomiting, stimulants freely, friction to limbs with warm hand, hot blankets, hot water bottles to extremities, coffee by rectum, and hypodermic injection of morphine.

HUNTER'S CHLORAL.

Syrup of chloral flavoured with syrup of tolu and elder flower. Strength ten grains or more to the drachm.

HYDRATE OF CHLORAL.

See CHLORAL.

HYDROCHLORIC ACID—MURIATIC ACID—SPIRITS OF SALT.

How taken.—Cases of poisoning not common. Usually mistaken for beer or brandy.

Symptoms.—Burning heat extending from throat to region of stomach, vomiting of acid fluid of a dark colour mixed with mucus and altered blood. Tongue swollen and dry, great thirst, difficulty in swallowing. Pulse small, frequent and irregular, skin cold and clammy. The mind usually remains clear till the last. Death may be delayed for some weeks.

Fatal Dose.—A drachm usually fatal, but recovery from larger quantity, even an ounce.

Treatment.—1. Large draughts of **soap and water** to be taken at once. **Bicarbonate of potassium,** bicarbonate of sodium, ammonia, sal volatile, or even common washing soda to be taken freely, well diluted with water.

Magnesia or lime water may be used if at hand.

2. Milk, oil, thick gruel, white of egg and water, gum and water, and linseed tea are all useful.

3. A hypodermic injection of **morphine** to ward off shock.

As a rule the stomach-pump cannot be employed with safety.

HYDROCYANIC ACID—PRUSSIC ACID.

How taken.—Accident. Suicide. Murder. Inhalation of vapour of anhydrous acid. The dilute acid of the British Pharmacopœia should contain 2 per cent. of anhydrous acid. Specimens, however, vary much in strength, some being as low as 0·6 and others as high as 3·2 per cent. This variation depends on the mode of manufacture, the length of time the specimen has been kept and the degree of exposure to light. Scheele's acid is a 4 per cent. solution.

Symptoms.—Come on in act of swallowing or almost immediately. Giddiness, staggering,

insensibility and loss of motor power. Eyes fixed and glistening, pupils dilated and not acting to light, limbs flaccid, skin cold and covered with clammy perspiration, pulse imperceptible. Violent gasping for breath, panting respiration and perhaps tetanic convulsions. When a fatal dose is taken the patient is nearly always insensible in two minutes. The poison is rapidly eliminated by the breath so that if life can be maintained for even half an hour recovery almost certain.

Fatal Dose.—Smallest fatal dose thirty minims of the official solution equivalent to six-tenths of a grain of the anhydrous acid. From forty minims to a drachm would probably prove fatal. Recovery from half an ounce of the official preparation equal to 4·8 grains of the anhydrous acid. Acts equally energetically whether swallowed, applied externally, dropped into the eye or inhaled. Usually proves fatal very quickly, shortest time two minutes, longest recorded fatal case an hour and a half. Ample time to cry out and even to pass from one room to another. Cases recorded of people who have fallen down insensible from merely smelling a bottle of the strong acid.

Treatment.—1. Give **stimulants**, brandy, chloric ether, ammonia, sal volatile, *ad libitum*. If patient cannot swallow give an enema, or brandy may be injected hypodermically. Inhalations of **ammonia** on a pocket handkerchief.

2. Alternate hot and cold **douche**, the water being dashed over the patient, or poured over head and chest from a height.

3. **Artificial respiration** (about 20 in the minute) to be kept up steadily. Inhalation of oxygen.

4. **Stomach-pump** or **Emetic** of mustard (a table-spoonful in water), or of sulphate of zinc (half a drachm in water), or of ipecacuanha wine (an ounce), if a large quantity taken, and the patient seen at once. Probably, however, no time to give an emetic.

5. A hypodermic injection of gr. $\frac{1}{50}$ of **atropine** (2 minims of the 1 in 100 solution), or 30 drops of tincture of belladonna by mouth. To be repeated if necessary.

6. **Battery.** Mild interrupted current to chest walls and over region of heart.

Tests.—The odour of hydrocyanic acid is characteristic and in the case of very dilute solutions becomes more pronounced on the

application of warmth. The vapour, which is very volatile, renders turbid a drop of nitrate of silver solution placed in a watch-glass or on a microscope slide. Manipulated in the same way it converts a drop of ammonium sulphide into ammonium sulphocyanide which on being evaporated to dryness on a water-bath gives a blood-red coloration with ferric chloride diluted to the point of being almost colourless. Scheele's test which consists of the formation of Prussian blue is perfectly reliable. All tests for hydrocyanic acid should be made with the least possible delay as the drug is very volatile. All specimens preserved for subsequent analysis should be secured in well stoppered bottles.

HYOSCYAMINE.

An alkaloid obtained from *Hyoscyamus niger*. Is also contained in *Atropa belladonna*, *Datura stramonium* and *Duboisia myoporides*. *Hyoscyamus niger* also contains hyoscine.

For treatment, see ATROPINE.

HYOSCYAMUS—HENBANE—HYOSCYAMUS NIGER.

How taken.—Plant eaten by mistake for parsnips. Henbane seeds have been mixed with celery seeds by mistake and used for cooking purposes. Tincture mistaken for black-draught.

Symptoms.—Great excitement, fulness of pulse, flushing of face, giddiness, loss of power in limbs, dilated pupils, double vision, nausea, and vomiting. From large doses, loss or incoherence of speech, delirium, confusion of thought, insensibility and coma or perhaps a condition resembling mania.

For treatment, see ATROPINE.

ICES—ICE-CREAM.

The penny ices sold in the streets in London are made chiefly by Italians living in the neighbourhood of Saffron Hill and Eyre Street Hill. Water ices consist of very little more

than frozen water, sugar and colouring matter. Cochineal is sometimes used for colouring purposes, but aniline red is more commonly employed. The aniline may not be free from arsenic but that is rarely taken into consideration. Cheapness is the desideratum and for three pence enough aniline can be purchased to colour thirty gallons of ice and poison fifty or even a hundred people. For cream ices a little milk is added, sufficient arrowroot to thicken it, and possibly a few rotten eggs. All the ingredients are of the cheapest possible description. To give the requisite colour saffron may be employed, but the inexpensive turmeric is the favourite. Serious symptoms have on more than one occasion followed the ingestion of ices sold in the street, as many as twenty patients having been treated in an afternoon. The symptoms were severe and on analysis it was found that the vomited matter contained carbolic acid. It appears that this antiseptic, or preparations containing it, is used to prevent the decomposition of the materials used in making the ices.

In some cases of poisoning by ice-cream it seems probable that the acute symptoms observed—dryness and constriction of the fauces,

nausea, retching, vomiting and purging—were due to the development in the milk used for their manufacture of a highly poisonous alkaloid to which the name tyrotoxicon has been given. Whereas in good drinking water there are rarely more than 100 bacteria per cubic centimetre, three samples of ice cream which were analysed contained respectively 2,150,000, 4,200,000 and 5,340,000 bacteria. The filthy conditions under which cheap ices are vended in the public streets of London and other large towns constitute a public danger and a menace to the health of the poorer classes.

IODINE.

How taken.—Usually by mistake; rarely used for purposes of murder or suicide.

Symptoms.—Pain and heat in throat and stomach, with vomiting and purging, vomited matter may be yellow from the iodine, or blue, if any starchy food in the stomach. Intense thirst. Stools may contain blood. Giddiness, faintness, and convulsive movements not uncommon.

Fatal dose.—Death from twenty grains, but

recovery from much larger quantity. Prognosis on the whole good.

Treatment.—1. **Stomach-tube** or **Emetic** of mustard (a table-spoonful in water), or of sulphate of zinc (a scruple in water), or ipecacuanha wine (half an ounce or more).

2. **Starch** and water, or arrowroot, or gruel, or white of egg and water, given freely.

3. Inhalations of **nitrate of amyl.**

4. Hypodermic injection of gr. ½ of **morphine** to relieve pain, to be repeated as often as necessary.

IODOFORM

Is a powerful antiseptic and deodorizer. In cases of phthisis may be given in one grain pills six times a day. When inhaled may act as an anæsthetic. The case is recorded of a man who was ordered a gramme of iodoform to use as an application to a chancre. The next day towards evening, as he had not been seen since the previous night, his friends broke into his room and found him lying on the bed in a deep sleep. He did not respond to their repeated shouting and had to be well shaken before he could be roused. He was unable to

account for his abnormal slumber for he had not indulged in any way on the previous day. Two hours later after a good dinner his clothes and breath still smelt strongly of iodoform. The box which had contained the iodoform was in the bed with powder scattered about. No ill effects were experienced with the exception of slight giddiness.

Two cases are recorded in which the internal administration of the drug produced disagreeable symptoms. One patient took forty-two grains in eight days and the other seventy-five grains in seven days. The symptoms produced were giddiness, vomiting and deep sleep from which the patient was roused with difficulty. This somnolence alternated with periods of excitement lasting several hours. This condition was followed by delirium, intense headache, a sense of impending death, spasmodic contractions of the muscles of the face and double vision. Deep inspiration alternated with periods of apnœa of about half a minute's duration. The symptoms gradually passed off in five or six days.

Cases of iodoform poisoning are not uncommon in surgical practice when the drug is used freely as an antiseptic dressing.

Symptoms.—Slight nocturnal delirium, unaccountable drowsiness and progressive emaciation with high temperature and rapid pulse. The symptoms sometimes closely resemble those of meningitis. In some cases death has occurred. Iodoform cannot be removed from a deep sinus or wound simply by washing with water. The best way would be to syringe it out with oil of eucalyptus. The symptoms occur most frequently when the iodoform is used in conjunction with carbolic acid dressings, the explanation given being that the carbolic acid irritates the kidneys and renders them less able to eliminate the iodine.

Dose.—Recovery from four drachms taken internally.

JABORANDI.

The hypodermic injection of gr. $\frac{1}{50}$ of atropine (2 minims of the 1 in 100 solution of sulphate of atropine) will at once arrest the symptoms. Thirty minims of tincture of belladonna by mouth will answer almost as well.

LABURNUM—CYTISUS LABURNUM.

All parts of plants are poisonous, wood, bark, leaves, flowers, pods and seeds. Poisonous properties depend on presence of Cytisine which is also contained in Arnica.

Symptoms.—Come on rapidly. Purging, vomiting, great restlessness, then drowsiness and insensibility with convulsive twichings.

Treatment.—1. **Stomach-pump** or **Emetic** of mustard (a table-spoonful in water), or of sulphate of zinc (twenty grains in water), or of ipecacuanha wine (an ounce in water).

2. **Stimulants** in moderation; brandy, chloric ether, sal volatile, &c.

3. Injection of a pint of hot strong **coffee** into the rectum.

4. Alternate hot and cold **douche** to the head and chest.

LAUREL WATER.

For treatment, see PRUSSIC ACID.

LEAD (ACUTE POISONING).

Any compound of lead soluble in the gastric juice might if taken in sufficient quantity give rise to acute symptoms. Most of the cases occur from taking the acetate "sugar of lead." Sometimes the carbonate, "white lead," is taken, and sometimes the subacetate in the form of Goulard's solution. Sugar of lead, formerly popular for suicidal purposes, now if taken at all it is generally by accident. It has been mixed with flour in place of alum. White lead has been mistaken for chalk, and Goulard's solution has been drunk instead of wine.

Symptoms.—Dryness of throat, metallic taste, great thirst. Colic, especially about the navel, relieved by pressure. Muscles of abdomen usually rigid. Always constipation. Cramps in the legs, cold sweats, paralysis of lower extremities, convulsions.

Fatal Dose.—Patient should recover from an ounce of the acetate which is not nearly such a powerful poison as is commonly supposed. Recovered from three-quarters of a pint of

Goulard's solution. Recovery after taking an ounce of white lead.

Treatment.—1. **Stomach-pump** or **Emetic** of mustard (a table-spoonful), or of sulphate of zinc (twenty grains), or of ipecacuanha (forty grains in water).

2. Give half a drachm of dilute **sulphuric acid,** or aromatic sulphuric acid in water; or half an ounce of **sulphate of magnesium** (Epsom salts); or half an ounce of **sulphate of sodium** (Glauber's salts); or all three may be given together freely diluted with water.

3. **Milk,** white of an egg and water, barley water. **Poultices** to abdomen.

4. If much pain, a hypodermic injection of gr. ⅛ of **morphine.**

5. A course of **iodide of potassium** to eliminate the drug.

Tests.—The characteristic tests for lead are sulphuric acid, a white precipitate; iodide of potassium, a yellow crystalline precipitate; bichromate of potassium, a yellow precipitate, and sulphuretted hydrogen, a black precipitate or coloration. The last is extremely delicate and will detect in solution one part in a million. Lead cannot be precipitated direct

from albuminous organic mixtures with sulphuretted hydrogen.

LOBELIA—INDIAN TOBACCO—LOBELIA INFLATA.

Much used by the Coffinites. Their theory is that "Heat is life and want of heat disease," so lobelia and capsicum are their chief remedies. Is also used by the "medical botanists" and "herbalists."

Symptoms.—Severe vomiting with intense depression and prostration. Headache, giddiness, tremors, insensibility, convulsions, collapse, death.

Fatal Dose.—A drachm of the powdered leaves would probably prove fatal. More likely to kill in old people and young children, especially when it is not rejected by vomiting.

Treatment.—1. As a rule Lobelia induces vomiting, and an emetic is not required. In elderly people or young children, it may be necessary to use the stomach-pump, or give an emetic of mustard, sulphate of zinc, or ipecacuanha wine.

2. **Tannic acid** or gallic acid (half a drachm) frequently repeated, or strong tea. To be introduced with stomach-pump, or syphon if necessary.

3. **Stimulants.** Brandy, sal volatile, chloric ether, &c., to be given freely.

4. Twenty minims of tincture of nux vomica by mouth, or better, a hypodermic injection of gr. $\frac{1}{25}$ of nitrite of **strychnine** (2 minims of a 1 in 50 solution).

5. **Warmth** to the surface, hot blankets, hot water-bottles, &c.

6. The **recumbent position** to be strictly maintained, even after the acute symptoms have subsided.

LORDS AND LADIES—COWS AND CALVES—THE PARSON IN THE PULPIT—WAKE ROBIN—CUCKOO-PINT.

(*Arum maculatum*).

Common all over England, abounds in moist hedgerows and shady woods.

How taken.—Commonly by children. In one case by an adult for tape-worm.

Symptoms.—Swelling of the tongue, vomiting and severe purging, convulsions, dilated pupils, insensibility, coma.

Treatment.—1. Emetic of sulphate of zinc or of ipecacuanha.

2. Dose of castor oil.

3. Cup of strong coffee.

4. Linseed meal poultices if much pain.

LUNAR CAUSTIC—NITRATE OF SILVER.

Portions of stick sometimes swallowed in making applications to the throat.

Symptoms.—Sometimes whitish flaky matter is vomited, turning black on exposure to the air.

Treatment.—1. **Common salt** dissolved in water or milk should be given freely.

2. An **emetic** of mustard (a table-spoonful in water), or sulphate of zinc (twenty grains), or ipecacuanha wine (a table-spoonful in water).

3. White of egg and water, barley water, arrowroot, &c.

LUCIFER MATCHES.

For treatment, see PHOSPHORUS.

MORPHIA—MORPHINE.

(ACUTE POISONING).

How taken.—Carelessness in dispensing or prescribing, in one case twelve grains were ordered instead of a twelfth of a grain. Hydrochlorate of morphine, given instead of hydrochlorate of quinine, the drugs having become mixed in the manufactory. Over-dose given hypodermically by accident. Local application to sores.

Symptoms.—At first may be mental excitement of a pleasurable nature, with increased physical activity and acceleration of heart's action. Then dryness of the mouth, increased thirst, headache, weariness, sense of weight in the limbs, incapacity for exertion, sleepiness, and diminished sensibility. This passes into a condition of deep sleep from which the patient cannot be awakened; reflex action ceases, eyes are half closed, the pupils strongly contracted (very rarely dilated), the lower jaw

falls and the skin is cold and clammy, the only sign of life being the continuance of circulation and respiration. Respiration is slow, laboured, irregular and stertorous, and the pulse is feeble, compressible, and perhaps, almost imperceptible. The pulse and respiration finally fail and death ensues.

Fatal Dose.—Death from half a grain of the acetate in one case, and from a grain many times; recovery after as much as twenty or thirty grains. With good treatment the patient ought to recover from four to six grains without much difficulty. Do not forget the possibility of a relapse from fresh absorption of poison. Also possibility of death from secondary symptoms.

Treatment.—1. If taken by mouth, use **stomach-tube,** or give an **emetic** of mustard (a table-spoonful or more in water), or of ipecacuanha (forty grains in water), or of sulphate of zinc (twenty grains or more in water), or a hypodermic injection of gr. $\frac{1}{10}$ of **apomorphine** may be given (5 minims of a 1 in 50 solution). Wash out the stomach thoroughly. In morphine poisoning, vomiting is induced with difficulty. If the morphine were taken hypodermically, the use of the stomach-tube would

still be desirable, as much of the alkaloid is eliminated by the mucous membrane of the stomach.

2. Give ten grains of permanganate of potassium dissolved in a pint of tepid water and repeat dose in half an hour. The dose of Condy's fluid is an ounce and a half in a pint of water. Morphine even when given hypodermically is partly eliminated by mucous membrane of stomach, so from time to time wash it out with tepid water to which a grain or two of the permanganate have been added. If the patient is insensible the stomach-tube must be used.

3. Keep the patient walking about, flap him with a wet towel, shout at him, and rouse him by every means in your power. Apply **battery** sharply to the limbs. **Ammonia** or sal volatile to the nose.

4. Inject a pint of hot strong **coffee** into the bowel, with stomach-pump, or enema apparatus.

5. Pour a large jug of **hot** and **cold water** alternately over his head from a height, and repeat it frequently, drying him in the intervals. Be cautious in use of cold effusions if collapse.

6. If signs of failure of respiration, give a hypodermic injection of gr. $\frac{1}{20}$ of sulphate of **atropine** (5 minims of the 1 in 100 solution) repeating it in a quarter of an hour if necessary. Atropine is a true physiological antidote to morphine, and gr. $\frac{1}{20}$ of atropine should be used for every grain of morphine taken. Another plan is to give from gr. $\frac{1}{4}$ to $\frac{1}{2}$ of atropine, repeating it in two hours if necessary. If atropine is not at hand, give a hypodermic injection of thirty minims of tincture of belladonna.

7. Inhalation of **nitrite of amyl.**.

8. **Artificial respiration** to be kept up steadily for at least two hours.

Tests.—If the alkaloid is heated on a watch-glass with a drop of strong sulphuric acid until the acid begins to fume and the mixture is then allowed to get quite cold, a drop of nitric acid produces a brilliant red colour. Ferric chloride produces a blue coloration. If to a solution containing morphine a solution of iodic acid is added a yellow or brown colour is produced. The last test is very delicate and $\frac{1}{20000}$ grain of morphine may be detected, but it requires great care and is reliable only in the hands of an expert.

MOTHER'S FRIEND.

This is a "soothing syrup" extensively used in some parts of the country. It is eminently adapted for increasing the infant mortality of the neighbourhood. Eight or ten drops usually answer the purpose, the child dying speedily with all the symptoms of opium poisoning. The jury generally return a verdict of accidental death, and mildly censure the chemist or patent medicine vendor from whom it was bought. It is said on good authority that 15,000 children are killed every year by soothing syrups and other similar preparations.

MUSHROOMS—POISONOUS FUNGI.

The poisonous fungi may be divided into two classes:—

I. Of which Agaricus phalloides is the type and phallin is the active principle.

II. Of which Agaricus muscarius is the type and muscarine is the active principle.

Phallin is a vegetable toxalbumin found not only in Agaricus phalloides but in A. mappa,

verna, recutita, and porphyria. It produces symptoms similar to those of acute atrophy of the liver.

Muscarine is the active principle of the Agaricus muscarius, of the Agaricus pantherinus and of the Boletus luridus. The Agaricus muscarius or fly fungus is one of the most beautiful of the Agaricini. It is usually bright red with yellow spots. Not plentiful in England but abundant in the Highlands. Used in Siberia and Kamschatka to produce intoxication.

How taken.—Mistaken for edible varieties, or taken in ignorance of poisonous properties.

Symptoms.—Usually appear in from half an hour to an hour. Violent colic with thirst, vomiting and diarrhœa. Great mental excitement followed by coma. Pulse slow, breathing stertorous, pupils dilated, extremities cold. Death from action on heart.

Fatal Dose.—Difficult to say; a very small quantity may kill.

As there would probably be a difficulty on the spur of the moment in distinguishing between different kinds of poisonous fungi it would be wise to adopt following treatment:—

Treatment.—1. **Stomach-tube** or **Emetic**

of mustard (a table-spoonful in water), or of sulphate of zinc (a scruple in water), or of ipecacuanha (a scruple of the powder in water).

2. **Atropine.** Give twenty drops of tincture of belladonna in water, or better a hypodermic injection of gr. $\frac{1}{50}$ of **atropine** (2 minims of the B.P. solution), to be repeated in half an hour if necessary. This is the specific antidote.

3. **Castor oil.** Give an ounce of castor oil to clear out the intestines.

4. **Stimulants.** Give stimulants such as brandy, spirits of ether (a drachm in water), spirits of chloroform (a drachm in water), or sal volatile (a drachm in water).

5. **Warmth** to extremities and poultices to abdomen.

It must be remembered that mushrooms disagree with many people, and there may be disturbance of the stomach and bowels after eating a perfectly harmless variety. Some kinds of mushrooms are very liable to decompose and then they act much in the same way as would bad meat or cheese. They are more likely to induce disagreeable symptoms if badly cooked. It is always dangerous to warm up a dish containing mushrooms.

For symptoms and treatment, see MUSCARINE.

MUSSEL POISONING.

Cases of poisoning from eating mussels not at all uncommon. May have been gathered from ship's bottom in dock and may be contaminated with copper from the sheathing or with arsenic from the paint.

Symptoms.—Uneasiness and weight at pit of the stomach, sensation of numbness in the extremities, heat, dryness, and constriction in mouth and throat, thirst, shivering, difficulty of breathing, cramps in the legs, swelling and inflammation of the eyes, colic, vomiting and purging, itching of the skin, urticaria, failure of heart's action, collapse, death.

Treatment.—1. **Emetic** of apomorphine (5 minims of the 1 in 50 solution hypodermically), sulphate of zinc, mustard or ipecacuanha.

2. **Castor oil.** An ounce at once to clear out the intestines.

3. **Stimulants.** To be given very freely, brandy, whisky, champagne, sal volatile, spirits of chloroform, spirits of ether. Hot-water

bottles to feet. Warm blankets. Rubbing limbs with brandy.

5. **Atropine.** Hypodermic injection of gr. $\frac{1}{50}$ of sulphate of atropine (2 minims of 1 in 100 solution), with, if much pain, half a grain of morphine (5 minims of the 1 in 10 solution).

NEPENTHE

Is said to consist of purified extract of opium, citrate of morphia, and grape sugar mixed with sherry. It is probably of about the same medicinal strength as laudanum. For treatment, see OPIUM.

NEURALINE.

An application for the cure of neuralgia, consists of tincture of aconite with chloroform and rose water. Said to contain about one drop and a half of Fleming's tincture in each bottle. For treatment, see ACONITE.

NICOTINA—NICOTINE.

An alkaloid obtained from tobacco. Like conine it is a liquid alkaloid. One of the most deadly poisons known, causing death in three minutes. Murder in one case, suicide in another. Fatal dose not determined. For treatment, see TOBACCO.

NIGHTSHADE.

There are several plants known as Nightshade.

1. The Woody Nightshade or Bitter Sweet, or Dulcamara (*Solanum dulcamara*), has purple flowers and red berries.

2. The Black or Garden Nightshade (*Solanum nigrum*) has white flowers and black berries.

3. The Deadly Nightshade or Dwale, or Belladonna (*Atropa belladonna*), has dingy flowers, berries the size of a cherry, marked with deep centre furrow, shining black when ripe.

For Deadly Nightshade, see BELLADONNA.

Berries of Woody Nightshade and Garden Nightshade sometimes prove fatal to children.

Symptoms.—Purging, vomiting and convulsions, alternating with coma.

Treatment.—1. **Emetic** of ipecacuanha or mustard and water.

2. **Purgative** of castor oil.

3. **Stimulants** freely. Such as brandy, gin, whiskey or wine.

4. **Tea** or coffee.

NITRATE OF POTASSIUM—NITRE—SALTPETRE.

How taken.—Usually accidentally, mistaken for Epsom salts, or sulphate of sodium.

Symptoms.—Severe burning pain in abdomen, nausea and vomiting, sometimes purging, coldness in the limbs, partial paralysis, tremors, convulsions, collapse.

Fatal Dose.—One ounce may prove fatal, but may recover from two.

Treatment.—1. **Stomach-tube** or **Emetic** of mustard (a table-spoonful in water), or sulphate of zinc (a scruple in water), or of ipecacuanha powder (a scruple in water).

2. **Mucilaginous drinks,** white of egg and water, linseed tea, olive oil, &c.

3. **Stimulants,** if much collapse, five drops of essence of camphor on sugar, or brandy and hot water freely. Brandy and water to be injected into rectum; or under skin if power of swallowing is lost.

4. **Warmth.** Patient to be wrapped in hot blankets, hot water to feet, limbs to be kept warm by rubbing. Recumbent position to be strictly maintained.

5. **Nitrite of amyl.** Inhalations of nitrite of amyl.

6. **Atropine.** Hypodermic injection of atropine (3 minims of the 1 in 100 solution) might be tried, if there were signs of heart failure.

NITRATE OF SILVER—LUNAR CAUSTIC.

Portions of stick may be swallowed in making applications to throat.

Symptoms.—Sometimes whitish flaky matter is vomited, which turns black on exposure to the air.

Treatment.—1. **Common salt** dissolved in water or milk, should be given freely.

2. An **emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (twenty grains in water), or of ipecacuanha (a scruple of the powder in water).

3. **White of egg,** barley water, arrowroot, &c.

NITRIC ACID—AQUA FORTIS.

How taken.—Accident or suicide. In one case acid was poured into a child's mouth; in another, into the ear whilst asleep. When a patient has a suicidal tendency, take care not to leave the nitric acid bottle about, after testing urine. Fumes dangerous when inhaled.

Symptoms come on immediately with intense burning pain in the throat and gullet extending to the stomach. Violent vomiting, the vomited matter consisting of food mixed with altered blood—brown in colour—and shreds of membrane stained yellow. It has an acid reaction and a characteristic odour. The mucous membrane of the mouth is soft and white, or may be yellow or even brown. There is great difficulty in speaking, and the

power of swallowing may be entirely lost. There is great pain in the abdomen, breathing is carried on with difficulty, the pulse is small, frequent and irregular, the surface is cold, and there may be rigors. There will probably be constipation and perhaps suppression of urine.

Fatal Dose.—Recovery after taking half an ounce, but two drachms might prove fatal.

Treatment.—1. Large draughts of **soap and water** to be taken at once. **Bicarbonate of potassium,** bicarbonate of sodium, **ammonia,** sal volatile or even **common washing soda,** to be taken freely, well diluted with water. Magnesia or **lime-water** may be used if at hand.

2. Milk, oil, thick gruel, white of egg and water, gum and water, and linseed tea, are all useful.

3. **Morphine.** A hypodermic injection of half a grain to ward off shock.

As a rule the stomach-pump cannot be employed with safety. If larynx involved, **tracheotomy** may be necessary. Stricture of the œsophagus might occur as a secondary result.

NITRITE OF AMYL.

Usually taken by angina pectoris patients in mistake for cough linctus or some other medicine. A patient of mine took a tea-spoonful, vomited in a few minutes and seemed none the worse for it. In another case a patient took four drachms and recovered. I know of no fatal case.

Treatment.—1. **Emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (twenty grains in water).

2. **Fresh air.** All windows and doors to be thrown wide open, and the patient fanned.

3. The **recumbent position** should be maintained.

4. **Artificial respiration** may be resorted to if necessary.

NITRITE OF SODIUM.

Used in treatment of epilepsy, angina pectoris and other diseases. Allied in general action to nitrite of amyl and nitro-glycerine.

Substance sold as nitrite of sodium often largely adulterated with the inert nitrate. Nitrite sometimes recommended in twenty grain dose, but too much, two or three grains enough if drug pure.

Symptoms.—Patient complained of "feeling giddy," "took all her strength away," was afraid she would "go off insensible"; blueness of face, lips and hands; throbbing all over body. Feeling of anxiety with prostration, nausea and vomiting.

Fatal Dose.—No fatal case on record.

Treatment.—1. **Emetic** of mustard, ipecacuanha or sulphate of zinc.

2. **Fresh air.**—Windows and doors to be thrown wide open and the patient fanned.

3. **Recumbent position** to be maintained.

4. **Ergot.** A drachm of liquid extract by mouth, or 5 minims of the Injectio Ergotini Hypodermica under the skin.

5. **Atropine.** Hypodermic injection of gr. $\frac{1}{80}$ of sulphate of atropine.

6. **Artificial respiration** if necessary.

NITRO-BENZIN — NITRO-BENZOL — ARTIFICIAL OIL OF BITTER ALMONDS—ESSENCE OF MIRBANE.

This is a pale yellow oily liquid having an odour resembling that of bitter almonds. It burns with a smoky flame.

How taken.—Workers in aniline dyes exposed to danger from handling it. Accidents from sucking syphons decanting it; the breaking of large carboys. Sometimes added to liqueurs or sweet-meats for the sake of its odour. Pomades sometimes scented with nitro-benzin. In one case, eighteen people poisoned by mistaking a flask of nitro-benzin for a cordial. May kill when taken in the gaseous form. In manufacture of "Sicherheit," a German patent explosive intended for blasting purposes in coal-mines, symptoms experienced closely resembling symptoms following inhalation of nitro-benzin. "Roburite," another expl sive, acts much in the same way. The inhalation of the fumes of this substance is very dangerous; and in one case, where it

was sprinkled on the floor of a bedroom to kill cockroaches, the patient had a narrow escape.

Symptoms may be curiously delayed even it is said for a day or two. Weariness, discomfort, nausea and a peculiar benumbing of the head. Great anxiety, want of breath, confusion of mind. Cyanosis often very marked, nails, tongue, lips and mouth nearly black. May be convulsions, sometimes like tetanus. Pupils dilated though they generally act a little to light. Death by asphyxia.

Fatal Dose.—From merely tasting it. Eight or nine drops perhaps.

Treatment.—1. **Stomach-tube** or **Emetic** of mustard (a scruple of the powder), or of sulphate of zinc (twenty grains in water), or of ipecacuanha (a scruple of the powder in water).

2. **Stimulants**, such as brandy, liquor ammoniæ (half a drachm in water), or chloric ether (a drachm in water), frequently repeated. If patient cannot swallow to be given as enema, or brandy may be injected under skin. Inhalations of ammonia on pocket handkerchief.

3. **Douche.** Alternate hot and cold douche,

the water being poured over the chest from a height.

4. **Atropine.** Hypodermic injection of gr. $\frac{1}{60}$ of atropine (2 minims of the 1 in 100 solution), or thirty drops of tincture of belladonna.

5. **Artificial respiration** to be maintained till the patient has recovered, or no further pulsation can be detected at the heart. Inhalation of oxygen.

6. **Battery.** Mild interrupted current to chest walls, and over region of the heart.

Tests.—It is converted into aniline by zinc and sulphuric acid. It is unchanged by sulphuric acid, a distinction from oil of bitter almonds which becomes crimson on the addition of this acid.

NITRO-GLYCERINE.

How taken.—Mistaken for beer. Mixed with gunpowder and taken for cure of boils. Used for blasting purposes, and as a remedy for angina pectoris, neuralgia and other complaints. Medicinally a one per cent. solution most commonly employed, but the five per cent. solution is often kept by chemists. See

Author's "Nitro-glycerine as a Remedy for Angina Pectoris."*

Symptoms.—Headache, throbbing increased by movement. Pulsation all over the body even to tips of the fingers. Arterial relaxation, the pulse tracings showing marked dicrotism. Slight flushing of the face. Mental confusion. Depression and feeling of anxiety. Nausea, sometimes even vomiting. Collapse, the patient falling down suddenly.

Fatal Dose.—No case on record from taking the one per cent. solution. Two mouthfuls of the crude drug fatal to an adult male.

Treatment.—1. **Recumbent position** to be strictly maintained.

2. **Cold water** cloths or ice to be applied to head.

3. **Ergot.** A drachm of liquid extract of ergot by mouth, or a grain of ergotin (three minims of the Injectio Ergotini Hypodermica) might be injected subcutaneously, and repeated in a quarter of an hour.

4. **Atropine.** A hypodermic injection of gr. $\frac{1}{60}$ of sulphate of atropine (two minims of the 1 in 100 solution), or thirty drops of tincture of belladonna by mouth.

* London: H. K. Lewis.

Belladonna is useful in the headache caused by nitro-glycerine.

NITROUS OXIDE GAS—LAUGHING GAS.

A safe anæsthetic for short operations such as extraction of teeth. Very few deaths on record and these chiefly from the gag or a tooth causing suffocation.

Treatment.—1. Pull the **tongue** well forward and see that the mouth is clear. See that there is no obstruction by artificial teeth. See that your gag is all right. If missing, turn your patient upside down and slap his back.

2. **Artificial respiration** to be commenced at once, and kept up for two hours if necessary, not faster than eighteen in the minute.

3. **Fresh air.** Loosen everything about the chest and neck. Open the doors and windows wide and fan the patient. Alternate hot and cold **douche** to chest and head.

4. **Oxygen gas.** Inhalation of compressed oxygen gas. Nitrite of amyl.

5. In apparently hopeless cases, two or three violent blows on the chest, delivered in quick succession, may restore the heart's action.

NUTMEG.

Why taken.—As a remedy for diarrhœa. To procure abortion.

Symptoms.—Patient stupid, giddy and drowsy. Marked restlessness. Delirium. Great thirst. Tightness in the chest. Vomiting.

Dose.—Recovery after taking five nutmegs powdered and mixed with sugar. No effect on pregnancy.

Treatment.—Coffee and stimulants.

NUX VOMICA.

(*Strychnos Nux Vomica*).

Sometimes known as Rats' Bane. Seeds called by the Germans "Crow's Eyes."

The seeds weigh about thirty grains—enough to cause death.

How taken.—Powder easily procured, used as a vermin killer. Extract taken by mistake. Suicide.

Symptoms.—See STRYCHNINE.

Fatal Dose.—Half a drachm of the powder or three grains of the extract.

Treatment.—1. **Stomach-pump,** or stomach-syphon, if available at once. for after tetanic symptoms have set in, the introduction of the tube would excite a paroxysm.

2. **Emetic** of sulphate of zinc (half a drachm in water), or of mustard (a table-spoonful in water), or of ipecacuanha (a scruple of the powder in water). Should a difficulty be experienced in opening the jaw, put the patient under chloroform, or ether, or give a hypodermic injection of gr. $\frac{1}{10}$ of apomorphine (5 minims of the 1 in 50 solution).

3. **Animal charcoal,** *ad libitum*, or tannic acid, or tincture of iodine. To be followed by another emetic.

4. **Bromide of potassium** (half an ounce) in bad cases, with chloral (thirty grains), to be followed by the bromide (in two drachm doses) with or without chloral (ten grains) every fifteen or twenty minutes as long as necessary.

5. **Nitrite of amyl** inhalations.

6. **Chloroform** or **ether** to the extent of producing muscular relaxation.

7. **Curare.** A hypodermic injection of gr. $\frac{1}{3}$ (4 minims of a 1 in 12 solution) may be given.

8. **Artificial respiration** if possible.

Tests.—The tests for strychnine may be utilised. Brucine gives a red coloration with nitric acid.

OIL OF VITRIOL.

See SULPHURIC ACID.

OPIUM.

How taken.—Any of the official preparations of opium might be taken—tincture, extract, liquid extract, wine, &c., or it might be taken in the form of "Black Drop," "Godfrey's Elixir," "Dalby's Carminative," or "Battley's Solution." Children often poisoned by infusions or decoctions of the leaves, seeds, or capsules of the poppy given to induce sleep or drowsiness. Cases of accidental poisoning from eating blossoms and fruit of the red poppy. Very commonly employed for suicidal purposes, also for murder. Cases of poisoning from use of opium in enemata and suppositories and from use of laudanum on poultices.

Symptoms.—Type of all simple narcotic

poisons. A preliminary stage of mental excitement of an agreeable nature with acceleration of the heart's action. Soon replaced by headache, weariness, a sensation of weight in the limbs, incapacity for exertion, sleepiness, diminution of sensibility and contraction of the pupils. At first the patient can be roused with difficulty, but after a time it is impossible to make the slightest impression on him, reflex action ceases, the eyes are half shut, the pupils fail to respond to light, the muscles are relaxed, the lower jaw falls, the skin is cold to the touch, and the face and lips are either pale or cyanotic. Respiration soon gets slow, irregular and stertorous, the pulse is weak and compressible, and death ensues.

Diagnosis.—Opium poisoning may be mistaken for acute alcoholism. The history of the case, the odour of the breath or of the vomited matter, and the presence of either alcohol or morphine in the urine are the chief points to which to attend. At the same time it must not be forgotten that a man who has been drinking, may poison himself with opium, and opium is not unfrequently taken in porter. In profound drunkenness the pupils are usually dilated. To distinguish opium poisoning

from apoplexy, look for paralysis of limbs or facial muscles, examine the condition of the heart and blood-vessels, and see if the pupils are equal. Distinguish from poisoning by chloroform, ether, &c., by smell in breath or in vomited matters. To distinguish from uræmic poisoning, history of case, condition of pupils, examination of urine. Cases of acetonæmia or diabetic coma sometimes mistaken for opium poisoning.

Fatal Dose.—Two and a half grains of extract, equal to five grains of opium, fatal. In one case death from a drachm of laudanum. Recovery from much larger doses, even from four or five ounces of the tincture. Children very susceptible to opium. The more strongly the pupils are contracted the worse the prognosis. Early vomiting is a good sign and th occurrence of copious sweating is favourable.

Treatment.—1. **Stomach-tube** or **Emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (twenty grains in water), or of ipecacuanha (a scruple of the powder in water). **Apomorphine,** a hypodermic injection of 5 minims of the 1 in 50 solution.

2. Give at once ten grains of permanganate

of potassium dissolved in a pint of water and repeat the dose in half an hour. Six grains of the permanganate will neutralize one ounce of laudanum. It is a good plan to add to the antidote two tea-spoonfuls of acetic acid or white vinegar so as to convert the morphine into a soluble salt. If Condy's fluid is used give an ounce and a half in a pint of water.

3. **Rousing.** Keep the patient walking about, flap him with a wet towel, shout at him, pinch him, and rouse him by every means in your power. Apply the battery to the limbs sharply. **Ammonia** or sal volatile to the nostrils. Do not give wine or brandy and do not drag about a patient who is in a state of collapse.

4. **Coffee.** A pint of hot strong coffee injected into the bowel.

5. **Douche.** Pour a jug of cold water and of hot water alternately over his head from a height, and repeat it frequently, drying him in the intervals. Be cautious not to increase collapse from too much cold water.

6. **Atropine.** Give a hypodermic injection of gr. $\frac{1}{20}$ of sulphate of atropine (5 minims of the official solution) if signs of failure of respiration. If atropine not at hand, give thirty

minims of tincture of belladonna hypodermically or by mouth, and repeat in a quarter of an hour. A dose of gr. $\frac{1}{20}$ of atropine would probably antagonise from two to three drachms of laudanum, but it would be safer to repeat the dose.

7. **Nitrite of Amyl.** Inhalations of nitrite of amyl freely.

8. **Artificial respiration** should be kept up for at least two hours if necessary.

Tests.—See tests for morphine. Meconic acid is sometimes more easily detected than morphine and indications of its presence are considered sufficient. To detect meconic acid in urine precipitate with lead acetate, filter and wash precipitate, decompose with dilute sulphuric, filter and neutralise and then test for meconic acid with ferric chloride which gives a red coloration not destroyed by dilute mineral acids or solution of corrosive sublimate. This test requires great care.

OPIUM AND BELLADONNA.

How taken.—Suicide; liniment by mistake.

Symptoms.—Will depend on relative proportion of drugs taken. As they are to some

extent antagonistic, symptoms may be slight. Said that gr. $\frac{1}{20}$ atropine will antagonise gr. i. morphine. Probably more danger from the opium than the belladonna, especially in children.

Treatment.—1. **Stomach-pump** or **Emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (twenty grains in water), or of ipecacuanha (a scruple of the powder in water). Hypodermic injection of apomorphine, 5 minims of the 1 in 50 solution, is a prompt emetic.

2. **Coffee.** An enema of a pint of hot strong coffee.

3. **Rousing.** The patient should be kept awake. Flicking with a wet towel, and mustard to the calves of the legs and over the region of the heart will be found useful. Alternate hot and cold douche over head and chest.

4. **Artificial respiration** may be resorted to if necessary.

OXALIC ACID.

A crystalline substance, the crystals somewhat resembling sulphate of magnesium and

sulphate of zinc. It has a strongly acid reaction. If pure, it burns away on heating without blackening.

How taken.—Mistaken for other drugs, especially Epsom Salts. Suicide. I have reason to think that it is sometimes used as an abortifacient. Oxalic acid itself may be used or salt of sorrel.

Symptoms.—Nothing pathognomonic—vary very much. May be almost instant death. More commonly burning pain in stomach, cramp in legs, vomiting of dark coloured fluid containing altered blood. Feeling of constriction in the throat with hacking cough. Purging. Mouth sore and usually white. May be tetanus or coma.

Fatal Dose.—Death from a drachm in a boy of sixteen; recovery from an ounce and a quarter.

Treatment.—1. **Chalk,** lime, or whitening, given freely in water. The whitewash from a wall, or fence, or ceiling, may be used. Lime-water is an antidote, but the saccharated solution being stronger is preferable. It should be given in drachm doses frequently repeated.

2. **Castor oil.** An ounce of castor oil should be given to clear out the intestines.

The administration of potash, soda, ammonia, or of carbonate of potassium, sodium or ammonium, should be avoided.

Tests.—Best separated from organic mixtures by dialysis. Is precipitated by lime salts, the calcium oxalate being recognised by its characteristic octahedral crystals. Dilute sulphuric acid with dioxide of manganese gives effervescence in the cold.

PARAFFIN OIL—PETROLEUM.

Petroleum occurs native in many parts of America, and is usually obtained by sinking wells. It is often imported as *rock oil*. Paraffin oil, also known as *kerosene*, *mineral oil*, &c., is obtained from petroleum by distillation. Vaseline, adepsine, chrisma, ozokerine, fossiline and paroline are petroleum products.

Several times mistaken for ginger-beer. Recovery after swallowing a pint of petroleum. Recovery after taking half pint of paraffin on an empty stomach.

Symptoms vary much. Intense burning sensation in mouth, œsophagus, and stomach; excreta covered with layer of petroleum presenting aspect of continuous grease spots.

Surface of body and extremities cold, face pale and anxious, pulse feeble but regular, and the respiration is sighing. Insatiable thirst and restlessness at night. Often coma.

Diagnosis easy from smell of breath and vomited matters. Prognosis good.

Treatment.—1. **Stomach-pump** or **Emetic.** Stimulants freely. Warmth to extremities.

PARALDEHYDE.

A colourless fluid recommended as a substitute for chloral. Serious symptoms from one drachm, but recovery from three and a half ounces.

Symptoms.—Odour of drug in the breath and in the urine, pupils contracted and insensitive to light, dyspnœa, unconsciousness, collapse, skin warm, pulse rapid.

Treatment.—As for chloral. Unconsciousness may persist for over thirty hours.

Cases of chronic paraldehyde poisoning are met with. Chief symptoms are anæmia, emaciation, rise of evening temperature, palpitation, muscular weakness with tremor of the tongue, facial muscles and hands, insomnia, hallucinations of sight and delusions.

PHENACETIN.

This drug is largely employed both as an antipyretic and as an analgesic and with equally good results. It is usually given in doses of from five to ten grains. If used with care it has a remarkable freedom from injurious action. It is allied in general action to antipyrin and antifebrin. Doses of 15 grains may be followed by vertigo, shivering, general malaise and somnolence. In one case after two fifteen grain doses the symptoms noticed were vomiting, great weakness and jaundice. The urine was thick and dark reddish-brown in colour and the patient died on the second day.

PHENAZONE.

See ANTIPYRIN.

PHOSPHORUS.

How taken.—As phosphorus paste (rat poison) or more rarely as phosphorus oil, phosphoric ether, or pure phosphorus. Only the

white phosphorus is poisonous, the red being inert, even in very large doses. Matches commonly sucked for suicidal purposes and cause of many accidents in children. Phosphorus acts powerfully when administered in a finely divided state as in the form of rat-paste or lucifer matches. Chronic poisoning in manufacture of matches. Enough phosphorus paste to cause death may be purchased at an oilman's for one penny, and no questions will be asked.

Symptoms.—Taste of garlic in the mouth. Pain in stomach. Eructation of phosphorus vapours. Intense thirst. Vomiting, but usually not persistent, vomited matters may be luminous in the dark. Odour of phosphorus may be perceptible in the breath. May be partial recovery, then jaundice with urticaria. Pain in region of liver, which is found to be enlarged. Considerable general disturbance, with weakness of heart's action. Tendency to hæmorrhage, there being bleeding from the nose, and in women from the vagina, vomiting of blood, and blood-stained motions. May be petechiæ or even extensive ecchymoses. The menses may appear. Failure of intellect shown by coma, and in some cases violent

noisy delirium. Convulsions not uncommon, terminating in coma. Urine diminished in quantity, albuminous. Death may occur from collapse suddenly and unexpectedly. If recovery, convalescence much protracted.

Fatal Dose.—Difficult to say. If taken in solid form probably not very fatal, much more likely to cause death if finely divided, or taken in solution. Death may ensue after five or six days. Recovery after sucking three hundred matches.

Treatment.—1. **Emetic** of sulphate of zinc (twenty grains in water), or ipecacuanha (a scruple of the powder in water).

2. **Sulphate of copper** in three grain doses dissolved in water, every five minutes till vomiting is induced. Continue the sulphate of copper in grain doses every quarter of an hour, giving with it ten drops of acetate of morphine, if rejected. Mucilaginous drinks are useful.

3. **French oil of turpentine.** Half drachm doses of the French oil of turpentine every half hour. Sanitas may be given. The German and American turpentines are useless.

4. A **purgative** of half an ounce of Epsom salts.

Oils and fats should not be given as they act as solvents and facilitate the absorption of the phosphorus.

PHYSOSTIGMA—CALABAR BEAN—THE ORDEAL BEAN OF WESTERN AFRICA.

How taken.—Beans left about and eaten by children.

Symptoms.—Giddiness, faintness, prostration, loss of power in the lower extremities. Muscular twitching. Contracted pupils. Mind clear to the last. Death from asphyxia.

Treatment.—1. **Stomach-tube** or an **Emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (twenty grains in water), or of ipecacuanha (a scruple of the powder in water). Apomorphine (5 minims of the 1 in 50 solution hypodermically) may be used as an emetic.

2. Dissolve ten grains of permanganate of potassium in a pint of tepid water and inject it by means of the stomach-tube, repeating the dose in half an hour.

3. **Atropine.** A hypodermic injection of gr. $\frac{1}{60}$ of sulphate of atropine (two minims of

PILOCARPINE.

Treatment.—**Atropine.** The hypodermic injection of gr. $\frac{1}{50}$ of atropine (two minims of the liquor) will at once arrest the symptoms. Thirty minims of tincture of belladonna by mouth will succeed almost as well.

PITURI.

(*Duboisia Hopwoodii*).

A stimulating narcotic used by the natives of New South Wales. In its action allied to tobacco. See *Journal of Physiology*, vol. i., p. 377; vol. ii., p. 132.

How taken.—Eye lotion taken by mistake.

Symptoms.—It is slightly narcotic; first salivates, then dries the mouth; is a powerful respiratory poison; produces general weakness, violent twitchings of the whole body and severe headache.

Treatment.—See ATROPINE.

POTASH.

Taken in form of caustic potash or solution of potash, usually by accident. An impure carbonate is often sold under name of "potash" for cleaning lamps, &c. Pearlash is also used for washing purposes.

Symptoms.—Whilst swallowing an acrid caustic taste. Mucous membrane of mouth partly destroyed. Heat and burning in the throat extending down to the stomach. Sometimes vomiting, the vomited matter being mixed with dark brown blood and shreds of mucous membrane. Skin cold and clammy. Purging with great pain in abdomen. May get stricture of œsophagus as a secondary result.

Treatment.—1. Give water freely, with **vinegar, acetic acid,** citric acid, **lemon juice,** or orange juice.

2. **Demulcent drinks,** such as white of egg and water, milk, gruel, and barley water. Olive oil.

PRIMULA.

Some species of Primula are poisonous. Many people after handling the leaves of the *Primula obconica* suffer from acute dermatitis which assumes an erysipelatous character. The face swells and large blisters form on the cheeks and chin. The symptoms soon subside and call for but little treatment with the exception of a simple lotion or ointment.

PRIVET.

(*Ligustrum vulgare*).

How taken.—Berries eaten by children. Leaves and shoots poisonous.

Symptoms.—Vomiting, purging, drowsiness and convulsions. It is said it may excite the menstrual flow, but I do not get this effect clinically from the administration of a strong tincture even in large doses frequently repeated.

Treatment.—Copious draughts of hot water to facilitate vomiting, stimulants, friction to

limbs, hot bottles to extremities with if necessary a hypodermic injection of morphia, would probably be the best treatment.

RAT-PASTES.

The ordinary phosphorus rat-paste is composed of phosphorus, fat, sugar and Prussian blue, the last-named being added for colouring purposes. A penny pot usually contains about four grains, or enough to kill at all events two people. A sixpenny pot would suffice for a whole family.

Sampson's rat-paste is said to contain arsenic as the active ingredient. Roth and Ringeisen's is composed of phosphorus and arsenic.

RED PRECIPITATE—RED OXIDE OF MERCURY.

How taken.—An active poison but seldom used for criminal purposes.

Symptoms.—Pains and cramps in lower extremities, vomiting, skin cold and clammy. After some days, gums may be affected.

Treatment.—1. **Stomach-pump** or **Emetic** of mustard, sulphate of zinc or ipecacuanha.

2. **White of egg** and water in unlimited quantities. Flour and water, arrowroot, gruel, barley-water or linseed tea.

3. **Stimulants,** brandy, chloric ether, sal volatile.

RESORCIN.

Also known as resorcinal and metadioxylbenzene. Isomeric with hydrochinon. Beautiful white feathery crystals, having very little odour but a sweet pungent taste. Used as an antiseptic and antipyretic, especially in Germany. Not much used in this country. One recorded case of poisoning.

Symptoms.—Giddiness, "pins and needles" all over. Insensibility, profuse perspiration from head to foot, lips blanched, tongue dry, pupils normal, conjunctivæ insensitive to touch, teeth clenched. Temperature low, 94·8° F. Urine black.

Fatal Dose.—Above symptoms from two drachms. Recovery with prompt treatment. Two drachms nearly proved fatal.

Treatment.—1. **Stomach-tube** or **Emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (a scruple in water), or of ipecacuanha wine. **White of egg** and water in large quantities. Wash out the stomach with **soda,** or with **saccharated lime,** mixed with large quantities of tepid water.

2. **Stimulants** freely; hot brandy and water, chloric ether, and sal volatile. **Warmth** to the extremities. Friction with the warm hand. **Interrupted current.**

3. **Atropine.** Hypodermic injection of gr. $\frac{1}{50}$ of sulphate of atropine (2 minims of 1 in 100 solution). Inhalations of **nitrite of amyl.**

Large doses of red wine are used in Germany as an antidote.

SALICYLIC ACID.

Salicylic acid is not usually regarded as a toxic substance. It is largely employed as a preservative for keeping the lighter forms of wine, lager beer, jams, cream and other substances. In a case in which I gave evidence a firm of wine merchants was charged under

the Food and Drugs Act, 1875, with selling orange wine containing ·038 per cent. of salicylic acid, or 26·6 grains to the gallon, but the prosecution was unable to show that it was injurious to health. I gave twenty patients suffering from rheumatism and other similar complaints eighteen grains of salicylic acid—the amount contained in half a gallon of the wine—three times a day for six weeks and observed no bad effects. One woman complained of slight deafness and of buzzing in the ears after taking the medicine for a month, but that was all. Probably any bad effects would be due to the use of an impure preparation and the rule now is to use the "natural" and not the "artificial" acid.

SALTS OF SORREL.

This is an acid oxalate of potassium, and is commonly known as salts of lemon. It is extensively used for straw bleaching and for removing ink stains and iron stains from linen. Half an ounce has proved fatal. For treatment, see OXALIC ACID.

SAVIN.

Taken to procure abortion. But also for other purposes. Taken as a powder, or the oil may be used.

Symptoms.—Pain, vomiting, violent straining at stool, coma or convulsions. Death in a few hours or not for some days.

Treatment.—1. **Emetic** of mustard (a tablespoonful of the powder in water), or of sulphate of zinc (20 grains in water), or of ipecacuanha (a scruple of the powder in water).

2. **Castor oil,** an ounce.

3. Linseed meal poultices to abdomen.

4. **Morphine.** Hypodermic injection of gr. $\frac{1}{3}$ if necessary.

SCHEELE'S ACID.

This is twice the strength of ordinary prussic acid. For treatment, see PRUSSIC ACID.

SCHEELE'S GREEN.

This is arsenite of copper. Used in small doses in treatment of cholera, dysentery and summer diarrhœa. For treatment, see ARSENIC.

SEWER GAS—CESSPOOL EMANATIONS.

Generally consists of a mixture of sulphuretted hydrogen, sulphide of ammonium and nitrogen, but is sometimes only deoxidised air, with an excess of carbonic acid gas. Fatal cases have occurred from clearing out cesspools, and from the entrance of sewer gas into bedrooms. Bad symptoms often experienced from merely inhaling gas from open gratings in the streets. Cesspools, privies, and sewers, before being cleared out should be stirred up to permit of escape of contained gas, and should then be thoroughly exposed to the air, and disinfectants freely used before being touched.

Symptoms.—If poison concentrated, death may be immediate. If not sufficiently concentrated to cause death at once, the following symptoms may result from a few minutes exposure:—insensibility, all attempts to restore consciousness being unavailing, lips livid, conjunctivæ injected, eyes fixed and turned upwards, pupils dilated and insensitive to light.

Respiration frequent, even sixty in the minute, pulse rapid, swallowing difficult or impossible. Tonic convulsions from time to time, almost as severe as in tetanus, the temperature rising to 104°. Death in twenty-four hours. If sewer gas much diluted, symptoms less severe, consisting only of nausea, diarrhœa, loss of appetite and headache, with a general feeling of malaise.

Treatment.—1. Plenty of **fresh pure air,** all doors and windows being open.

2. **Artificial respiration.** Sixteen in the minute; to be kept up by relays of people for many hours. Inhalation of pure oxygen.

3. **Ammonia** to the nostrils. Friction and warmth to the extremities with brandy if necessary. Interrupted current to the limbs.

4. Stimulants in moderate quantities, hot **brandy and water** or gin and water for example. To be injected into the rectum if power of swallowing gone.

5. **Coffee.** Injection of a pint of hot strong coffee into the rectum.

6. **Douche.** Hot and cold alternately to head and chest. **Bleeding** or transfusion might be resorted to. **Catheter to be used in** prolonged cases.

SIMPSON'S RAT PASTE.

Unlike most Vermin Killers does not contain strychnine. Said to be composed of starch, malt, and arsenious acid (40 per cent.), scented with oil of rhodium. For treatment, see ARSENIC.

SNAKE-BITE.

In Great Britain and the greater part of Europe the only poisonous snake is the adder, a variety of viper. In India the most destructive species are the cobra, krait, echia, and daboia. Deaths in India from snake-bite estimated at 20,000 a year. Activity of venom differs in character and intensity, in different genera and species. Differs in same individual under varying conditions of temperature, climate, exhaustion, &c. Poison absorbed by mucous membrane so that sucking wound not altogether unattended with danger.

Symptoms.—Intense shock. Locally partial paralysis, pain, infiltration, swelling, inflammation and ecchymosis. Depression, faintness, cold sweats, nausea, vomiting, exhaustion,

lethargy, loss of consciousness. Paralysis, first of lower extremities then of whole body, including tongue and muscles of deglutition. Albuminuria (especially in viperine poisoning), hæmorrhage, relaxation of sphincters, exhaustion, lethargy, convulsions, death.

It must be remembered that all snake poisons are not identical in action.

1. **Ligature.** A ligature—a pocket handkerchief, or piece of rope, if nothing better at hand—should be tied tightly round the limb between the wound and the heart. Suck the wound if there is no abrasion of the mouth or gums, and spit out the saliva, taking a little brandy immediately after.

2. **Incision and cauterisation.** Make an incision through the bite, reflect the skin so as to expose the tissues wherever altered in colour, and dissect them out thoroughly. Then cauterise with a red hot iron or live coal, or apply strong nitric acid, or solution of permanganate of potassium. If no better means available explode gunpowder on the part.

3. **Strychnine** has been largely employed in cases of snake bite both in Australia and in India. Gr. $\frac{1}{60}$ should be injected into the arm, the dose being repeated cautiously at

frequent intervals, until if necessary ten doses have been given.

4. **Stimulants.** Brandy, whiskey, champagne, &c., should be given very freely even to the extent of making the patient intoxicated. People who have been bitten by venomous snake will take almost any amount of alcohol. A man bitten by a cottonmouth took one hundred and four fluid ounces—over four pints—of strong apple brandy in less than four hours and at the end of the time he was only comfortably drunk. Total abstainers should avoid rattlesnakes.

5. **Bleeding** followed by **transfusion** is likely to prove of avail. For composition of solution see Tranfusion, p. 36. Might bleed from one arm and transfuse fresh blood into the other.

6. **Artificial respiration** should be maintained for some hours. Keep the patient warm and at rest, and give him plenty of fresh air.

7. **Permanganate of potassium.** This is De Lacerda's treatment. Inject under the skin in two or more places, 20 minims of solution of permanganate of potassium, which should if possible be freshly prepared. It is essential that the antidote should come in

actual contact with the poison, and it is a good plan to inject into the orifice made by the fangs of the snake. It is a chemical not a physiological antidote. If limb much swollen make three or four injections at circumference of the swelling. Efficacy of this mode of treatment problematic.

8. **Potash.** May use liquor potassæ, one part with six of water, in same way, but would be necessary to use it with more caution. Also give liquor potassæ by mouth, twelve minims in brandy every hour; value very doubtful.

9. **Ammonia.** Halford's plan consists of the injection into the radial vein, by means of a hypodermic syringe of twelve minims of the liquor ammoniæ fortior, diluted with three times its volume of water. The vein should be first exposed.

10. **Olive oil.** Olive oil used freely both internally and externally is said to be an absolute specific in cases of rattlesnake bite.

11. Undoubtedly the remedy of the future is the **Antivenene**, discovered by Prof. T. R. Fraser of Edinburgh. The dried substance should be dissolved in water and injected hypodermically about the seat of the wound.

The ligature should be removed for a second or two at a time, and then quickly reapplied so as to admit only a small quantity of the poison into the circulation.

12. People who live in districts where cobras and other venomous snakes abound should from time to time take small doses of the venom by mouth so as to render themselves immune. This is probably the secret of the confidence with which snake charmers handle these animals with impunity.

SOAP LEES.

This consists of carbonate of potassium, or sodium, mixed with caustic alkali. For treatment, see POTASH.

SODA.

Treatment.—1. **Vinegar, acetic acid,** citric acid, **lemon-juice,** or orange-juice, freely diluted with water.

2. **Demulcent drinks,** such as white of egg and water, milk, gruel and barley water.

3. **Olive oil** freely.

SQUILL.

An active heart poison. Symptoms allied to those of DIGITALIS.

STRAMONIUM—THORN-APPLE—DEVIL'S APPLE—JAMESTOWN WEED.

(*Datura stramonium*).

Annual plant common in England, frequently found in waste places and growing on dung-hills. Easy of cultivation.

In India the *Datura fastuosa* is largely used for criminal purposes, the class using it being known as the *Daturiahs*. The plant is common in India, and the natives are very familiar with its effects as an intoxicant, and death-dealing drug. It is used for the purpose of murder, and also for hocussing so that the victim may be more easily robbed. A box taken from a professional poisoner, contained:—(1) datura seed, (2) powdered seed for mixing with food, (3) an essence of datura for mixing

with sugar, tobacco, and flour, (4) flour mixed with datura flour.

How taken.—Infusion of leaves mistaken for for senna tea, and for horehound tea. Seeds eaten by children. Extract dispensed for extract of sarsaparilla.

Symptoms.—Similar to belladonna poisoning. Dryness of skin and throat. Dilated pupils. Delirium, spectral illusions, double vision. Rash on skin. Paralysis of lower extremities. Coma.

Fatal Dose.—One hundred seeds killed a child two years old. Death from decoction of one hundred and twenty-five seeds. Recovery after taking half an ounce of the leaves infused in boiling water.

Treatment.—As for BELLADONNA.

STRYCHNINE.

An alkaloid found both in Nux Vomica seed (*Strychnos nux vomica*) and St. Ignatius' Bean (*Strychnos ignatia*), also in some of the other Strychnaceæ.

How taken.—Cases of poisoning of very frequent occurrence. Many deaths from vermin killers, which are usually made of meal or

flour with strychnine and perhaps arsenic. The names of Butler. Battle and Gibson are not unfamiliar to the toxicologist. Death from eating pheasants, larks and other birds killed with strychnine. Often mistaken for santonin, which it somewhat resembles.—also given instead of salicin and of jalapin and rhubarb. In one case sold for tooth powder, and in another as a seidlitz powder. In one instance a man inoculated his hand with it whilst making rat poison. Often used for suicidal purposes, sometimes for murder.

Symptoms.—Tetanus, convulsions coming on in paroxysms at intervals varying in different cases from three minutes to half an hour, each lasting from one to five minutes or even longer. Opisthotonus, as a rule the whole body being arched backwards, but sometimes emprosthotonus (arched forwards) or pleurotonus (sideways). During paroxysm eyeballs prominent and pupils dilated, respiration impeded, pulse feeble and very rapid. Sometimes convulsive screams. Often great anxiety. Usually death from asphyxia during a paroxysm, or may be from collapse.

Diagnosis.—Only difficulty is from idiopathic or traumatic tetanus.

1. Absence or presence of a wound may be some guide, but if wound small or not of recent date will not give much help.

2. In traumatic tetanus paroxysm affects chiefly the masseters, the cervical muscles and muscles of the extremities, the muscles of respiration being less involved. In strychnine poisoning tetanus of respiratory muscles very prominent.

3. In traumatic tetanus trismus or lockjaw is usually the first symptom. In strychnine poisoning it may be absent, but never lasts longer than the spasm of the other muscles, and it is never the only symptom.

4. In traumatic tetanus epigastric pain—probably from spasm of the diaphragm—is always severe, whilst in strychnine tetanus it is absent.

5. Strychnine tetanus runs its course in a few hours, ordinary tetanus may last for some days.

Fatal Dose.—Three grains usually fatal. Smaller doses sometimes fatal, gr. $\frac{1}{2}$ for example; gr. $\frac{1}{16}$ may kill a child. In one case recovery after twenty grains but an emetic was given at once.

Treatment.—1. **Stomach-tube,** if it can be quickly obtained, for after tetanic symptoms have set in, the introduction of the tube would excite a paroxysm, and it would be useless. An **emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (twenty grains in water), or of ipecacuanha (a scruple of the powder in water). Should a difficulty be experienced in opening the jaw, a hypodermic injection of apomorphine (5 minims of the 1 in 50 solution) should be given, or the patient may be put under chloroform or ether.

2. **Animal charcoal,** *ad libitum*, or **tannic acid,** *ad libitum*, or tincture of iodine. To be followed by an emetic, or the stomach-pump.

3. **Bromide of potassium,** half an ounce in water, with thirty grains of **hydrate of chloral.** Two drachms of the bromide with or without ten grains of chloral may be given every fifteen or twenty minutes if necessary.

4. **Nitrite of amyl** inhalations, the amyl being poured freely on a handkerchief and held close to the nose.

5. The patient may be kept fully under **chloroform** or **ether.**

6. **Curare.** A hypodermic injection of gr. $\frac{1}{3}$ (4 minims of the 1 in 12 solution) may be given.

7. **Artificial respiration** if possible. *This is important.*

Tests.—Both physiological and chemical tests for strychnine are extremely delicate. Dr. Dupré tells me he thinks it would be possible to detect chemically $\frac{1}{200000}$ grain. The alkaloid has a characteristic bitter persistent taste. It is only very slightly soluble in water but readily imparts its bitter taste to the most dilute solutions. Bichromate of potassium precipitates chromate of strychnine, which is easily recognised under the microscope by its crystalline form. If the solid strychnine residue is dissolved in a few drops of cold strong sulphuric acid, the addition of an oxidising agent such as a crystal of bichromate of potassium or a little binoxide of manganese produces a magnificent play of colours—blue, violet, purple and red predominating.

STRYCHNINE AND MORPHINE.

The morphine delays the appearance of strychnine poisoning for some time—in one case for eight hours.

SULPHONAL.

Largely employed as a hypnotic. May produce giddiness, ataxic disturbance of certain fine movements of the hand and loss of motor power in the legs. Patients "unable to stand," "unable to stand or walk properly," "present the appearance of being drunk, tumbling and walking about unsteadily." In some cases a papular skin eruption. In one case death in 40 hours after two fifteen grain doses taken in an hour and a quarter. In another case patient took over an ounce. When seen was completely insensible, pupils normal and reacting to light, anæsthesia, especially of conjunctivæ, profuse perspiration, suppression of urine. Death suddenly on fourth day.

The ordinary symptoms of "sulphonism" are noises in the ears, headache, vertigo, weakness and incapacity for mental or physical work. Other symptoms noticed are ptosis, œdema of the eyelids and cyanosis. When sulphonal is administered continuously for some weeks at a time the patients suffer from gastro-intestinal disturbances, vomiting and

constipation, swelling of the joints, pain in the lower extremities, failure of co-ordination and diminution of the reflexes with a scanty secretion of urine which often presents a peculiar red colour.

Treatment.—Emetic. Strong coffee. Five minims of solution of strychnine hypodermi cally.

SULPHUR.

Sulphur is not usually regarded as a poison, being quite insoluble in water, but in one case an ounce of sublimed sulphur taken on two successive days for piles, gave rise to alarming symptoms. The patient was found lying on his back, prostrate and partially insensible. He had had repeated rigors and complained of intense frontal and vertical headache with griping pains in the bowels. His temperature was 104°, pulse hard and quick, 140 in the minute, tongue dry and furred, breath smelling strongly of sulphuretted hydrogen, pupils contracted and insensitive to light, skin bathed in perspiration, abdomen tympanic and tender on pressure. Retching and vomiting were almost

incessant, and there was profuse purging, both vomited matter and dejecta containing blood-stained mucus mixed with fine particles of sulphur. He made a good recovery after the application of hot fomentations to the abdomen and the administration of a dose of castor oil.

SULPHURIC ACID—VITRIOL—OIL OF VITRIOL.

How taken.—Used for suicidal purposes by domestics, mechanics, &c. Mistaken for some beverage. Used in an enema in place of olive oil. For purposes of murder given to children whilst asleep. Pouring acid in ears of victim whilst asleep.

Symptoms.—Burning pain extending from mouth to stomach. Mucous membrane of mouth white in colour. Vomiting and violent retching, black bloody masses being ejected in large quantities. Insensibility with perhaps violent tetanic spasm from the intensity of the pain. Death may occur very rapidly, or if stomach empty, perforation, peritonitis, and death less rapidly. If life prolonged, raging

thirst with inability to swallow. Aphonia. Copious salivation. Skin pale and cold, and covered with clammy perspiration. Shreds of mucous membrane may be detached in vomited matter or with motions. Death perhaps from secondary symptoms, such as stricture of the œsophagus.

Fatal Dose.—Much depends on amount of food n the stomach. Almost any appreciable dose may cause death, but on the other hand a patient might recover after taking as much as an ounce.

Treatment.—1. **Soap and water, chalk and water,** whitewash and water to be taken freely. Large draughts of **water** if nothing else at hand. *The nearest remedy is the best.* Time all important.

2. **Magnesia, lime-water,** or **bicarbonate of sodium,** or bicarbonate of potassium. Common **washing soda** diluted freely with water will do.

3. **Milk, white of egg,** oil, linseed tea, hick gruel or arrowroot are all useful.

4. **Morphine.** A hypodermic injection of half a grain to ward off shock.

As a rule the stomach-pump cannot be employed with safety.

Tests.—White precipitate with barium nitrate insoluble in hydrochloric acid even on boiling. In the case of very dilute acid put a drop of the solution on filter paper, dry carefully over a spirit lamp or candle, when a deep black spot of charred paper will gradually appear.

See also VITRIOL THROWING.

TARTARIC ACID.

How taken.—Mistaken for aperient medicine.

Symptoms.—Great pain in abdomen, convulsions, collapse, death.

Fatal Dose.—One ounce.

Treatment.—1. **Chalk, lime,** or whitening given freely in water. The whitewash from a wall, or fence, or ceiling may be used. Lime water is an antidote, but the saturated solution being stronger is better. It should be given in drachm doses frequently repeated.

2. **Castor oil.** An ounce of castor oil should be given to clear out the intestines.

The administration of potash, soda, ammonia, or the carbonates should be avoided.

TEETHING POWDERS.

Commonly prepared according to following formula:—Calomel, one grain; Dover's powder, two grains; sugar of milk, three grains. Mix. This is the dose for a child over one year of age. Children under twelve months are given half or a quarter of a powder. If bad symptoms result, treatment should be as for opium poisoning.

TOBACCO—NICOTIANA TABACUM.

How taken.—Mistaken for coffee. Overdose given as an emetic. Tobacco chewing. Used as a compress for wounds. Taken to cure worms. Applied locally to cure itch. Used to procure abortion. Accidents common from giving children old tobacco-pipes to blow soap-bubbles. Packets of cigarettes six a penny sold to boys a source of danger.

Symptoms.—Nausea, vomiting accompanied by great weakness and faintness. Confusion of ideas, dimness of sight, weak pulse, cold

skin covered with clammy perspiration. Pupils at first contracted and then dilated.

Fatal Dose.—Death in a boy from smoking pennyworth of twist tobacco.

Treatment.—1. **Stomach-tube** or **Emetic** of mustard (a table-spoonful in water), sulphate of zinc (twenty grains in water), or of ipecacuanha (a scruple of the powder in water).

2. **Tannic acid,** half a drachm in water repeated frequently, or strong tea. To be introduced by the stomach-pump if necessary.

3 **Nux Vomica.** Twenty minims of nux vomica by mouth, or better, a hypodermic injection of gr. $\frac{1}{25}$ of **strychnine** (2 minims of the 1 in 50 nitrate of strychnine solution).

4. **Stimulants.** Brandy, champagne, sal volatile, chloric ether, to be given freely.

5. **Warmth** to the surface by hot bricks, hot blankets, &c. Friction with the warm hand.

6. **Recumbent position** should be strictly maintained.

TURPENTINE—OIL OF TURPENTINE—SPIRITS OF TURPENTINE—TURPS.

How taken.—Sometimes given to children for criminal purposes. Taken to expel worms. Given in mistake for other medicines.

Symptoms.—Odour in breath. Intoxication. Contracted pupils, stertorous breathing, coma, collapse, and tetanic convulsions. Irritability of bladder, the urine having the odour of violets. Some resemblance to poisoning by opium.

Fatal Dose.—Child under two years of age recovered after taking a table-spoonful.

Treatment.—1. **Stomach-pump** or **Emetic** of sulphate of zinc (twenty grains in water), or of ipecacuanha (a scruple of the powder in water). Should these fail, a hypodermic injection of gr. $\frac{1}{8}$ of **apomorphine** (10 minims of the 1 in 50 solution) may be given.

2. **Sulphate of magnesium**, an ounce in water as a purgative.

3. **Demulcent drinks**, such as milk, white of egg and water, barley water, &c.

4. **Morphine.** If much pain, a hypodermic

injection of half a grain of morphine, or thirty drops of laudanum by mouth.

VASELINE.

In former editions it was stated that several cases of poisoning had occurred from taking vaseline internally on sugar for a cold or sore-throat. I am informed that the cases to which reference was made were due to the administration of the pharmacopœial preparation and not to vaseline itself. Vaseline is now largely employed internally in the treatment of phthisis and other lung complaints, and even in large doses produces no disagreeable symptoms. "Vaseline" is a protected name and should be applied only to the product manufactured by one particular firm.

VERATRIA—VERATRINE.

An alkaloid found in Sabadilla and probably also in *Veratrum album* and *Veratrum viride*. May be crystalline but is more commonly amorphous. No odour, strongly and persistently bitter, and highly acrid taste.

How taken.—Usually mistaken for other medicinal substances. Murder.

Symptoms.—Burning sensation in throat and gullet with increased secretion of saliva. Painful sensation may extend to stomach, and there may be inability to swallow. Retching and vomiting, diarrhœa and pain in the bowels. Headache, palpitation, with feeling of anxiety, giddiness, faintness, slow and weak pulse, respiration superficial and laboured. Pupils generally dilated but may be contracted. May be convulsions.

Treatment.—1. **Stomach-tube** or **Emetic** of mustard (a table-spoonful of the powder in water), or sulphate of zinc (twenty grains in water), or of ipecacuanha (a scruple of the powder in water).

2. **Stimulants,** brandy, champagne, chloric ether, sal volatile, &c.

3. **Coffee.** Hot strong coffee, injected into the rectum if necessary.

4. **Warmth** to the extremities, hot water bottles, warm blankets, friction with the warm hand, &c.

5. **Recumbent position** to be strictly maintained.

VERMIN KILLERS.

Usually contain strychnine, arsenic or phosphorus. *Battle's* consists of 23 per cent. of strychnine with sugar, flour and Prussian blue. *Butler's* consists of 5 per cent. of strychnine mixed with flour and soot; a sixpenny packet weighs about a drachm and contains from 2 to 3 grains of strychnine. *Gibson's* contains half a grain in each packet. *Simpson's* contains 40 per cent. of arsenious acid with starch and malt. *Roth and Ringeisen's* is composed of phosphorus and arsenic.

"VITRIOL THROWING."

This has become a popular amusement of late years. It is a woman's mode of marking her appreciation of her husband's infidelity.

Treatment.—1. Wipe off the acid at once and wash the face in water, using soap freely. A handful of soda or bicarbonate of sodium, or bicarbonate of potassium, in a basin of water is still better. Be as quick as you can.

2. Should the acid have gone in the eyes

first wash them with water and then syringe them with an alkaline lotion (five grains of bicarbonate of sodium to the ounce of water). Open the lids and drop in a few drops of castor oil or olive oil.

3. Keep your patient quiet and in a darkened room. If much shock, give brandy and water or champagne, followed by a hypodermic injection of morphine (4 minims of the 1 in 12 solution).

4. If any elevation of temperature during the first twenty-four hours give a minim of tincture of aconite every ten minutes for the first hour and then hourly for six hours.

WARBURG'S TINCTURE.

A remedy of great value in the treatment of intermittent and remittent fevers. Consists of sulphate of quinine (nine and a half grains to the ounce), Socotrine aloes, rhubarb, "confec. Damocrates" (a mixture of aromatics official in Ph. Lond., 1746), elecampagne, crocus, fennel, prepared chalk, gentian root, zedoary (a kind of ginger), cubebs, myrrh, camphor, white agaric (the agaric of the larch, see *Practitioner*,

November, 1882), and proof spirit. The dose is half an ounce repeated in three hours. For full account of uses, &c., see *Lancet*, Nov. 13th, 1875.

WHITE PRECIPITATE.

Symptoms.—Vomiting, cramps, purging, griping pains in the stomach, convulsions.

Fatal Dose.—Not a very active poison, might recover after taking three drachms or more.

Treatment.—1. **Stomach-tube** or **Emetic** of mustard (a table-spoonful of the powder in water), or of sulphate of zinc (twenty grains in water), or of ipecacuanha (a scruple in water).

2. **White of egg** (unboiled), mixed with water, to be given in unlimited quantities. **Flour** and water, arrowroot, gruel, barley water, and linseed tea, are all useful.

3. **Stimulants,** brandy, chloric ether, sal volatile.

WINE.

Wine is not usually regarded as an acute poison even by total abstinence advocates, but I know a man, an American, on whom a

single glass of champagne taken at any time acts as a prompt and powerful emetic. The brand makes no difference, and both sweet and dry champagnes affect him in the same way. He tells me that it has been so from his boyhood upwards, and that before he recognised his idiosyncrasy he was often surprised by the violent sickness which occasionally followed what appeared to be a moderate and carefully selected dinner. He is not particularly susceptible to the action of alcohol in other forms, and can take port, sherry and Burgundy without inconvenience. Effervescing waters he drinks on occasion, but for some reason which he can hardly explain he avoids them as much as possible.

A short time ago he accepted an invitation to dine with an old friend and go to the theatre after. His host was a connoisseur of champagne and had no other wine on the table. He chaffed my friend about his "fads and fancies" until at last, much against his better judgment, he was induced to take a single glass of champagne, which he sipped slowly, making it last throughout the dinner. He felt very uncomfortable, but was fortunately not obliged to leave the table. At the

conclusion of the repast they took a cab and started for the theatre. They had not gone half a mile before my friend was attacked with such severe faintness and violent nausea that the vehicle had to be stopped at the nearest hotel. He managed to reach the lavatory with difficulty and was immediately seized with an attack of vomiting which lasted over an hour. His pulse grew weak and he presented all the features of collapse. Half a tumbler of eight star brandy was forced down his throat, and little by little he recovered and was ultimately enabled to proceed to the theatre.

I have never met with an exactly analogous case, but a student of mine at the Hospital tells me that a glass of champagne taken on an empty stomach always acts with him as an emetic. He can take his fair share at dinner, a fact for which many of his friends are in a position to vouch.

YEW.

(*Taxus baccata*).

How taken.—Leaves or berries eaten by children or lunatics. Decoction of leaves taken

to bring on the menses. Yew-tree tea sometimes used to procure abortion.

Symptoms.—Convulsions, insensibility, coma, dilated pupils, paleness of the countenance, small pulse, cold extremities, nausea and vomiting. Death may be sudden and unexpected.

Fatal Dose.—Not known, but said that a teaspoonful of the leaves has caused the death of an adult.

Treatment.—1. **Emetic** of mustard, sulphate of zinc or ipecacuanha.

2. **Stimulants** freely, such as brandy, champagne, sal volatile or chloric ether.

ZINC.

The chloride is the salt which most commonly gives rise to dangerous symptoms. Used in soldering as a flux. Basis of Burnett's Disinfecting Fluid which contains about 230 grains to the ounce. White vitriol is the sulphate.

Symptoms.—Corrosion of lips and mucous membrane of the mouth. Pain and burning sensation in throat and stomach, incessant

vomiting of blood-stained fluid, difficulty of swallowing, acceleration of pulse and respiration, dyspnœa, dilatation of pupils, epileptiform convulsions, paralysis of the voluntary muscles, coma, death. In one case destruction of the whole of the stomach.

Treatment.—1. **Carbonate of sodium** or **carbonate of potassium** in large quantities dissolved in warm water. Common washing soda will do if well diluted.

2. **Milk** and **eggs** freely, with tepid water.

3. **Tannic acid,** gallic acid, decoction of oak bark, or **strong tea.**

4. **Morphine.** A hypodermic injection of half a grain, or thirty drops of laudanum by mouth.

5. Linseed meal poultices to abdomen.

6. If much pain in the abdomen, an enema of gruel or starch and water may be given.

CHRONIC POISONING

CHRONIC POISONING.

Cases of chronic poisoning by certain drugs are of constant occurrence in medical practice, and as the symptoms they present, and the treatment they require, differ somewhat from those of acute poisoning, it has been thought best to deal with them separately.

ABSINTHE—ABSINTHISM.

Absinthe or wormwood is the *Artemesia absinthium*, an indigenous plant belonging to the Compositæ. It contains a volatile oil and a bitter principle, absinthine. The liqueur is an alcoholic solution of oil of wormwood with a little angelica, anise and marjoram.

The habitual use of this liqueur produces a condition which has been called *absinthism*.

It is characterised by restlessness at night with disturbed dreams, nausea and vomiting in the morning, trembling of the hands and

tongue, vertigo and epileptiform convulsions in which the patient loses consciousness, falls, bites his tongue, foams at the mouth, makes grimaces and throws his arms about.

Hallucinations occur without any of the other symptoms of delirium tremens, and when tremors co-exist they are limited for the most part to the muscles of the arms and hands.

The drug exerts its action chiefly on the cervical portion of the spinal cord.

The prognosis is not unfavourable if the habit be discontinued.

ALCOHOL—CHRONIC ALCOHOLISM.

Cases of chronic alcoholism are so common that it seems hardly necessary to describe them.

It must be remembered that it is not so much the quantity we take as the inferior quality with which we are supplied.

The alcoholic stimulant in whatever form it may be taken should be free from fusel oil to such an extent that a healthy man, even after exceeding considerably, should not experience any other effect than that of pure stimulation.

If on the following morning there is persistent headache, followed by continued dilatation of the cerebral blood-vessels, with incapacity for work, and dulness of ideas, it may be taken for granted that the wine was bad and contained fusel oil.

There is no test except the physiological one readily applicable to wines and other similar products of complex composition.

The most injurious of all alcoholic drinks is the spirit obtained from potatoes, as it contains by far the largest proportion of fusel oil. It is used as a basis for making many of the cheaper forms of spirits in common use.

Symptoms.—The symptoms vary somewhat in different cases, but as a rule, the chronic drinker suffers from loss of appetite, nausea and morning vomiting, a furred tongue, and a characteristic breath.

The limbs become tremulous and enfeebled, the face is dull and expressionless, and presents a plentiful eruption of "grog blossoms."

The sleep is disturbed, the patient is low spirited and vacillating, and is cowardly, cunning, and essentially untruthful.

In addition the patient may present symptoms of commencing cirrhosis of the liver, or

may exhibit indications of affections of the nervous centres, such as delirium tremens, epilepsy, mania, dementia, or general paralysis.

A gouty diathesis may make itself unpleasantly felt, and cause the sufferer infinite trouble; on the whole his lot is not a happy one.

There are two causes of morning vomiting, drink and pregnancy. When pregnancy can be excluded, alcoholism is the alternative diagnosis.

For a detailed account of the varieties of chronic alcoholism see Murrell's *Pharmacology and Therapeutics*.

Treatment.—When a man drinks there is no possibility of doing him any good if he is left to his own devices. If he can be taken in hand and a strong will substituted for his own weak one, there is a chance for him. Sometimes a woman can be found to perform this function. Often she is a dismal failure, but she may be a striking success. It is the choice of two evils.

There is no specific drug cure for alcoholism.

Hypnotism has of late been vaunted as a cure for alcoholism. Sometimes it acts well.

If you can "put an impression" upon a man and induce him to believe that a brandy and soda will act as an emetic, he will probably abstain from trying the experiment. You would probably get an equally good result from acting on his "moral nature," only as a rule he has none.

The only method of reclaiming a drunkard is to put him in a "Retreat" under the provisions of the Habitual Drunkards Acts (42 & 43 Vic., C. 19, and 51 & 52 Vic., C. 19). The great difficulty with a man is that if you lock him up he can do no work, and his income stops. With women it does not matter for as a rule they are not bread winners.

Another difficulty is that the patient's consent has to be obtained, and although a man may be a slave to drink, he often has a very great objection to sacrifice what he calls "his liberty."

Under the Act the retreat for the reception of patients must be duly licensed, and must be open to inspection at least twice a year.

The patient who wishes to enter the establishment, must make application in writing, stating the period during which he wishes to remain under treatment. His application will

not be entertained unless accompanied by a certificate of immoral character attested by two justices whose business it is to see that he understands the nature of his application.

These formalities having been satisfactorily arranged, the patient will be detained during the time he has selected, which, however, must not exceed one year. Should he escape he may be arrested on a warrant, and any person assisting him to escape may be punished; moreover it is an offence to supply the patient with any intoxicating drink, or with any sedative or stimulant drug without the authority of the licensee or the medical attendant.

In the way of accessory treatment, various drugs such as arsenic, iron, and bromide of sodium will be found useful. Cod-liver oil and extract of malt may be resorted to from time to time as accessories.

No one as yet seems to have succeeded in producing a satisfactory temperance drink, but a good attempt may be made by adding a wineglassful of essence of malt—not the extract—and a tea-spoonful of the tincture of quassia, to a tumblerful of any effervescing water.

Alcohol may be readily separated from organic mixtures and concentrated by distillation. There are many chemical tests; those depending on the formation of aldehyde with sulphuric acid and bichromate of potassium, and of iodoform with potash and solution of iodine in iodide of potassium being the best. The odours both of aldehyde and of iodoform are sufficiently characteristic.

ARSENICAL POISONING.

Cases of chronic poisoning by arsenic are by no means of unfrequent occurrence. It is an unquestionable fact that the public health is suffering from the use of arsenic in the manufacture of fabrics and other articles, to an extent not yet fully appreciated.

Wall papers often contain large quantities of arsenic, and the use of this deleterious ingredient is by no means confined to green papers. As a matter of fact the green colour of wall papers is more commonly due to the presence of copper than of arsenic. Arsenic is used in the preparation of a great variety of colours, and is found even in French white. The fact of a paper being marked "non-arsenical" is

no proof that it does not contain arsenic. Arsenic occurs commonly, not only in wall papers, but in candles, carpets, advertisement cards, playing cards, wrappers for sweets, ornaments for children's toys, india-rubber balls, dolls, japanned goods, Venetian blinds, floor-cloths, book-binding, and a number of other things. Artificial florists are frequent sufferers.

The subject of chronic arsenical poisoning produced by arsenical wall papers is of especial interest. It is probable that a volatile arsine is produced by the action of arsenic on the size employed for attaching the paper to the wall, aided by the action of warmth and moisture. In this connection see PTOMAINES and AQUA TOFANA.

Arsenic is present in large quantities in the coloured wrappers of many cigarettes. This is persistently denied by the manufacturers, but I have gone into the matter thoroughly with Dr. Wilson Hake and there is no doubt about the fact.

The symptoms are puffiness of the eyelids, smarting and redness of the eyes, thirst and dryness of the mouth, and redness of the lining membrane of the nose. Loss of appetite, and a sensation of weight or soreness at the pit of the stomach, accompanied with a dry and dirty looking skin, often covered with scales or sore patches, are common symptoms. Aching pains are experienced in the limbs and joints, whilst the sleep is broken or disturbed by dreams. The voice is rough and harsh, and there are nausea, vomiting and diarrhœa, the motions being slimy and containing blood. Other symptoms are spitting of blood, great loss of flesh and general debility. Chronic arsenical poison has on more than one occasion been mistaken for phthisis.

The treatment consists in the removal of the cause. If due to arsenical wall paper, the paper should be stripped from the walls and burnt. Change of air and scene are important. Tonics such as cod-liver oil, iron, quinine, and extract of malt should be given freely.

CHLORAL—CHLORALISM.

Cases of chloralism are by no means uncommon, and are met chiefly amongst ladies who go out a great deal in society, and think they need a sedative after the exertions of the day and night. Many of these women smoke

a good many cigarettes and drink as well, so that it is not always easy to say how much is due to the chloral, and how much to the other disturbing causes.

The symptoms commonly met with are:—

1. Digestive troubles probably due to the direct action of the drug on the mucous membrane of the stomach.

2. Dyspnœa which may be slight and felt only on exertion, or may be persistent and alarming.

3. Skin eruptions, usually urticarial in character. Petechiæ and ecchymoses are met with, and ulceration about the nails is not uncommon.

4. Frequently the patient exhibits an excited, hurried manner, is voluble in speech, and suffers from vertigo, wakefulness, and depression of spirits. After a time there is a certain amount of enfeebled nerve power and weakened mental activity.

The only way of treating these patients is to cut off the supply. If the patient can be kept without money, and if chemists and grocers and patent medicine vendors can be warned against supplying her with drugs the habit may be broken. If these steps cannot

be taken the only plan is to put her in a retreat or establishment where she can obtain nothing but what is given her.

Most of these patients end up by taking an over-dose and killing themselves. The usual verdict is "death by misadventure."

COCAINE—THE COCAINE HABIT—COCAINE INEBRIETY—COCAINISM.

It is generally admitted that the excessive use of coca is injurious, and that the confirmed "coquero" or chewer becomes after a time listless, haggard, and gloomy. He is not fit for much, either mentally or physically and is anything but a lively companion. But the dangers arising from the habitual use of cocaine are much more pronounced, and cocaine inebriety is now a well recognised disease.

Cocainism is not the outcome of using the drug at long intervals. Its comparatively transient effect and the demands of an over stimulated nervous system necessitate frequent resort to the drug.

To some people nothing is more fascinating and seductive than indulgence in cocaine. It

relieves the sense of exhaustion, dispels mental depression and produces a delicious state of exhilaration and well being.

The after effects are at first slight, almost imperceptible, but continual indulgence creates a craving which must be satisfied at all risks. The patient then becomes nervous, tremulous, sleepless, and without appetite, and is reduced to a condition of pitiable neurasthenia.

Erlenmeyer calls cocaine the third scourge of humanity, alcohol and opium being the first and second.

The symptoms commonly experienced from the prolonged use of cocaine are illusions of sight and hearing, neuro-muscular irritability and analgesia. In some recorded cases the patient has suffered from sleeplessness—which, however, as a rule, soon passes away—dyspepsia, palpitation, an indisposition for work, an inaptitude for arriving at a prompt decision, and a disposition to shun society.

Different kinds of Coca Wine are largely used by the public in doses of from half an ounce to four ounces. There is one kind of Coca Wine standardised to contain one-eighth of a grain of the pure alkaloid in two drachms which requires to be used with caution.

LEAD.

"WRIST DROP"—"LEAD COLIC"—"PLUMBISM"—"LEAD PALSY."

Lead is often spoken of as being a ubiquitous poison. From its manifold uses cases of lead poisoning are of constant occurrence. The modes in which it is introduced into the system may be classified as follows:—

1. Occupation.

(*a*) *House painters* suffer from lead poisoning, from neglecting to wash their hands before taking food. In grinding the carbonate which is largely used as a basis for paints, the fine particles are often inhaled in sufficient quantity to produce lead poisoning. Sleeping in a freshly painted room has been known to produce it.

(*b*) *Potters* who use lead for glazing purposes are frequently sufferers. It is not common amongst those who handle the metallic ore—lead miners for example.

(*c*) *Compositors* suffer from handling the type, type metal containing lead.

(*d*) *Barmen* suffer from handling and cleaning pewter pots, and from drinking in the morning the first glass of beer which has stood in leaden pipes all night.

(*e*) *Card players* suffer from the lead glaze on the cards, especially if they moisten the fingers in the mouth when dealing.

(*f*) *File cutters*.—The files are bedded in lead whilst being "nicked," and there is much dust and much "leading" of the hands, clothes, &c.

(*g*) *Electrical light workers*.—The plates are frequently bedded in red lead, and often the plates are made from red lead and nitric acid. I have met with a good many of these cases. See "The occurrence of Plumbism amongst Safety Electric Lamp Workers." *Medical Press and Circular*, March 8th, 1893.

(*h*) *Japanners*.—The japanned articles are brushed over with colours containing lead, much dust being produced in the process.

(*i*) *Enamellers*.—The dust employed contains lead and a little arsenic. Cases are very common.

2. Articles of Food.

(*a*) *Tinned foods*.—Meat, fish, shell-fish, fruits and vegetables packed in tins soldered with lead-alloys are distinctly unsafe.

The articles most heavily loaded with lead are those substances which are rich in fatty matters, such as fish preserved in oil.

(*b*) *Farinaceous foods* are often contaminated by being kept in lead wrappers.

(*c*) *Pickles* when the jars or bottles are capped with leaden tops are very injurious.

(*d*) *Loaf sugar* sometimes contains lead from the moulds in which the sugar is set, being painted with white lead, a portion of which is taken up mechanically.

(*e*) *Snuff* may be adulterated with red lead or may be unsafe from having been wrapped in leaden covers.

3. Articles of Drink.

(*a*) *Water*.—Drinking water often becomes contaminated with the lead dissolved from lead pipes and the lining of cisterns. Pure water, and water containing carbonic acid, carbonate of lime or sulphate of lime, have little or no

action on lead. Carbonic acid indeed acts as a protective, by covering the lead with a fine insoluble film of the carbonate. Water containing much oxygen, nitrites, nitrates, chlorides, and especially organic matter, acts quickly on lead. Even a very small quantity, as little as $\frac{1}{50}$ grain in a gallon may suffice to produce lead poisoning, Water containing $\frac{1}{20}$ grain to the gallon should be rejected as unsafe. A case is recorded from drinking water which had been allowed to stand in a cheap corrugated iron bucket. It has long been known that the use of moorland water often gives rise to lead poisoning. It has been suggested that the moors may become impregnated by the shot scattered over them by sportsmen whilst shooting.

(*b*) *Wine* is sometimes sweetened with acetate of lead, and produces lead poisoning. Shot are sometimes used for cleaning bottles, and if not turned out may be dissolved by the acid wine.

(*c*) *Spirits.*—Rum stored in leaden tanks or cisterns on board ship has caused lead poisoning in sailors.

(*d*) *Cyder* made in glazed earthenware vessels may prove injurious.

(*e*) *Lemonade and Soda water* may produce lead poisoning when patent syphon tops are used.

(*f*) *Beer* is often contaminated by the lead pipes when the sale is not brisk, and people who take the first glass in the morning, are especially liable to suffer.

(*g*) *Milk* which is sour readily becomes impregnated with lead.

(*h*) *Tea* packed in lead is another source of trouble. Tea made in a metal teapot, and drunk out of a tin mug, which had been soldered, is recorded as a source of poisoning.

4. Articles of Apparel.

(*a*) Lead in the lining of hats has been known to produce lead poisoning.

(*b*) Brussels lace is often whitened with a preparation of lead.

5. Medicines.

Lead given medicinally has been known to excite chronic lead poisoning, but it is of comparatively rare occurrence from this cause, and

the acetate is often given in five grain doses three times a day for weeks or even months to check diarrhœa or hæmorrhage without producing bad effects.

6. Dyes and Cosmetics.

(*a*) *Hair dyes* are a constant scource of lead poisoning.

(*b*) *Cosmetics* containing lead have been known to prove injurious to actors, actresses, and professional beauties.

A case is recorded of lead poisoning from the use of "novelty transfer pictures" which were impressed on the hands and then licked off by the tongue. The boy died, and the post-mortem appearances were consistent with poisoning by lead. On chemical examination the pictures were found to be largely impregnated with lead.

In some cases of well-marked lead poisoning, the source of introduction of the poison may not be discovered, even after the most careful investigation. In one case which presented much difficulty, the symptoms were ultimately traced to presence of a leaden bullet which had lodged in the head of the tibia.

Symptoms.

(*a*) *Cachexia.*—One of the earliest symptoms of plumbism is cachexia. There is a general feeling of ill-health and nutrition is not maintained. An anæmic condition is soon developed, and the skin acquires a dull earthy hue. There is a marked diminution in the red blood corpuscles, and a slight increase in the white ones.

(*b*) *Blue line on the gums.*—The blue line is observed at the edge of the gums where they join the teeth. It is one of the first symptoms to appear, and the last to disappear. It is always most marked opposite the incisors. It is absent when there are no teeth, and is well-marked in people who fail to clean their teeth. It is seldom met with in people who scrupulously use the tooth brush. It is due to the formation of sulphide of lead. The decomposition of food left about the margins of the teeth and in their interstices, gives rise to the formation of sulphuretted hydrogen which acts on the lead in the tissues, and favours its deposition. The discoloration of the gums is not uniform, but is distributed in loops corres-

ponding to the vascular papillæ of the mucous membrane. The pigment consists of granules, some of which are deposited inside, and some outside the small blood vessels. The discoloration sometimes extends to the whole of the gums, and even to the contiguous portions of the cheek. The teeth are often discoloured, and the gums are retracted.

(*c*) *Colic—Lead colic—"Painter's colic."*—This is a tearing pain usually referred to the region of the umbilicus. The abdominal walls are retracted and rigid, and the pain is usually relieved by pressure, though not always. It is probably due to irregular contraction of the involuntary muscular tissue of the intestines. It is usually accompained by digestive derangement, constipation, foul tongue, and fœtid breath.

(*d*) *Cramps.*—There are often cramps in the calves of the legs, in the penis and scrotum in men, and in the womb in women. There may be pains in the joints, especially of the extremities, often simulating rheumatism, and aggravated by cold and wet weather.

(*e*) *Lead paralysis or wrist drop*, usually of the extensors of the forearm, especially those muscles supplied by the posterior interosseous

branch of the musculo-spiral nerve. The supinator longus is supplied by a branch of the musculo-spiral nerve, before it divides into the posterior interosseous. This affords a point of diagnosis between paralysis from lead poisoning, and paralysis from disease of the musculo-spiral nerve. If the muscle is paralysed, it shows that the disease is not limited to the posterior interosseous nerve, and that it is probably not due to lead poisoning. The condition of the supinator longus is tested in this way :—"Extend the paralysed forearm on the table with the radius upwards, then press down the wrist, and tell the patient to raise it from the table. The supinator longus if not paralysed, becomes hard, contracted, and stands out firmly." In lead paralysis the muscles of the ball of the thumb waste, and in severe cases the deltoid and even the muscles of the neck and trunk are similarly affected. General paralysis may occur. As a rule there is only loss of motor power but there may be loss of sensation. Swellings of an oval or elongated shape frequently form on the tendons at the back of the wrist, contrasting prominently with the atrophied muscles.

The muscles post mortem are found to be greyish-red in colour or whitish and tough with considerable increase in the interstitial connective tissue. The origin of the disease is probably in the spinal cord, and is due to hyperæmia and proliferation of the neuroglia with consequent contraction causing degeneration of the cellular elements.

(*e*) *Nervous Phenomena.*—Of the cerebral phenomena to which the term *saturnine encephalopathies* has been applied, epileptiform convulsions are the most common. They are usually preceded by intense headache, vertigo, and dimness of vision. They may occur early in the disease, and come on quite suddenly and without warning. The convulsions which ensue later, are associated with an albuminous condition of the urine, and are probably due to anæmia.

(*f*) *Menstrual disturbances.*—Profuse menstruation is in women a common accompaniment of lead poisoning, and so is abortion. The husband may cause the woman to abort even when she is not a lead worker.

(*g*) *General symptoms.*—Irritability ot mind, loss of sleep, tearing and burning pain in the shoulders and arms, marked anæmia, wasting,

and disturbance of digestion are common. Anæsthesia of large tracts of skin is often seen. Amaurosis and loss of sexual appetite are other symptoms.

The relationship existing between lead poisoning and gout is well known.

Treatment.—1. Blue pill at bed-time, saline draught in morning.

2. Sulphate of magnesium, one drachm; sulphate of iron, three grains; dilute sulphuric acid, fifteen minims; spirit of chloroform, fifteen minims, and peppermint water to an ounce. To be taken three times a day for four days. Fifteen minims of tincture of belladonna may be added to each dose if there is much colic.

3. Iodide of potassium, fivegrains; spirit of chloroform, fifteen minims; water to an ounce. To be taken three times a day

4. Good diet. Cod-liver oil. Extract of malt. Chemical food. Syrup of hypophosphites. Port wine.

5. Massage is of value in these cases, especially for the paralysed muscles. Much depends upon the form of massage employed, and on the duration and frequency of each application. (See *Massotherapeutics*,

or Massage as a Mode of Treatment, 5th edition).*

6. Faradisation for paralysed and wasting muscles, from ten to fifteen minutes daily, for two or three months. The slowly interrupted constant current similarly employed is even more efficacious. Passive movements or light dumb-bells for the extensors of the wrist may prove useful.

7. Hypodermic injections of strychnine, grain $\frac{1}{12}$ or more, into forearm once or twice a week very useful.

All of no avail if source of ingestion of lead not discovered and arrested. Prophylactic treatment is of the utmost importance, especially to workers in lead. The work-rooms should be thoroughly ventilated. Respirators should be provided and worn in the factory. Hands should be washed, and outer garments changed before leaving work. Meals should never be taken in the work-rooms. The workers should be examined by the medical officer at least once a week, and those exhibiting signs of commencing plumbism should be suspended for a period of three months. Warm baths should be taken frequently. No one should be allowed to begin the work of the day without having had a substantial meal. Sulphuric acid drinks should be supplied to the work-people.

* London: H. K. Lewis.

MERCURY.

MERCURIALISM—HYDRARGYRISM—PTYALISM.

Cases of chronic mercurial poisoning are not so common now, as they were in the days when it was the fashion to treat every case of suspected syphilis with large doses of mercury. Still they are met with from time to time, and the symptoms presented are the following:—

1. There is a disagreeable metallic taste in the mouth. The gums become swollen and tender, and assume a dark red colour. The teeth feel sticky as though their edges were glued together. The tongue swells and is covered with a thick fur, and the breath is offensive.

2. Ptyalism or salivation; the secretion of the saliva being increased to such an extent

that there may be from a pint to a pint and a half in the twenty-four hours.

3. Stomatitis or ulceration of the mucous membrane of the mouth comes next, and is often extensive.

4. A rash appears on the skin—*eczema mercuriale*—and periostitis is not uncommon.

5. Mercurial erithism; a low febrile condition, accompanied by intense prostration, and associated with anæmia, loss of flesh, and profuse purging.

6. Mercurial tremor, various forms of paralysis, and epileptiform convulsions are met with towards the last.

Workers in mercury, such as water-gilders, looking-glass makers, and the makers of barometers and thermometers, who inhale the vapour of metallic mercury, exhibit a somewhat different train of symptoms. They suffer from "mercurial tremors." These tremors may come on suddenly, but usually appear gradually. The upper extremities are affected first, and then little by little the whole body. The patient who suffers from these tremors loses all power of co ordination, so that he cannot carry a glass of water to his lips, cannot put his feet steadily to the ground, and

when he attempts to walk, breaks into a dancing trot. Delirium, mania and imbecility are the ultimate results.

With regard to treatment the great thing is to remove the cause. Gargles of chlorate of potassium and borax, tonics, good feeding, fresh air, and port wine, are all useful.

Electrical workers, and those engaged in the manufacture of incandescent lamps, who often suffer from mercurial poisoning, derive benefit from frequently taking small doses of iodide of potassium dissolved in milk.

MORPHIA—MORPHINE—THE MORPHIA OR MORPHINE HABIT.

The introduction of the hypodermic syringe has placed into the hands of man, a means of intoxication more seductive than any which has hitherto contributed to his craving for narcotic stimulation. It is usually first resorted to for the relief of chronic pain, such as neuralgia or rheumatism. The dose is rapidly increased until as much as sixty grains of morphine may be taken in the day.

I. In slight cases when the administration of the drug is still in the hands of the medical adviser, the following rules will be found useful:—

1. Do not stop the injections suddenly.

2. Diminish the dose gradually and without telling the patient.

3. Do not give morphine alone, but combine it with atropine.

4. Diminish the dose of morphine, and increase the dose of atropine until the effects of the latter predominate. When the full effects of the atropine are experienced, the patient will complain that the injections have lost their effect, and will ask to have them discontinued.

II. In more confirmed cases when the administration of the drug is in the hands of the patient, the following hints will prove of service:—

1. The patient must give up the custody of the syringe and morphine solution.

2. The dose must be diminished gradually so as to make but little demand on the moral strength and self-control of the patient. The rate of reduction should not exceed gr. $\frac{1}{16}$ every three or four days.

3. The bowels should be kept well open.

4. Tonics should be given—quinine, iron, strychnine and so on.

5. If the patient cannot sleep, give bromide of sodium in half drachm doses in plenty of water every night at bed-time. The dose may be repeated if necessary.

6. If the stomach is irritable or if diarrhœa is a prominent symptom, give carbonate of bismuth in half drachm doses in milk three times a day. Another good remedy is carbolic acid and tincture of iodine, equal parts, a drop in water three times a day before meals.

7. If much depression, stimulants may be given, but cautiously and only in measured doses. Dry iced champagne is useful and so is Coca Wine.

8. Isolation may have to be resorted to, but it is better to keep the patient occupied and amused.

9. The patient must be fed up. A good cook is half the battle.

10. A valuable therapeutic agent in these cases is **Massage**. It is impossible to lay down definite rules which will be applicable to every case. Every case must be taken on its own merits. The form of Massage to be em-

ployed and the frequency and duration of the *séances* are matters of consideration.

OPIUM HABIT.

Is opium-eating or opium-smoking necessarily and universally pernicious?

It has been too much the custom of writers on this subject to content themselves with drawing a doleful picture of a confirmed opium-debauchee, plunged in the lowest depths of moral and physical exhaustion; and having formed the premises of their argument from this exception, to proceed at once to involve the whole practice in sweeping condemnation.

We are told that the habitual opium-eater can be "recognised at a glance," that there is a "characteristic attenuation," a "withered countenance," a "halting gait," and a "glassy deep-sunk eye."

His digestive organs are "in the highest degree disturbed," he eats nothing, has hardly an evacuation a week, and is a "perfect wreck" both mentally and bodily.

By degrees as the habit becomes more confirmed, his strength fails so that at last he can hardly crawl from place to place.

After long indulgence, he suffers from "nervous or neuralgic pains," from which his beloved opium affords no relief.

His agony when the drug fails to produce its accustomed effect is terrible, and he suffers "the torments of the damned."

Such are the accounts given by most of the older writers on the subject, but it is doubtful if there is much truth in them.

Much of our knowledge of the effects of opium on the system is derived from the Confessions of De Quincey, the English opium-eater; and he tell us that from 1804 to 1812, a period of eight years, during which he was a dilettante eater of opium, he enjoyed perfect health, and was never better in his life. It was only later when he took the drug in enormous quantities that his health suffered.

It is well known that the Chinese are a nation of opium-eaters, and yet they are a muscular and well-formed race, the labouring classes being capable of great and prolonged exertion under a fierce sun and in an unhealthy climate.

Many people have attained the age of sixty or seventy who have been habitual opium-eaters for thirty years or more.

Should it be found necessary to undertake systematic treatment the following general indications may be followed :—

1. Place the patient under favourable hygienic conditions. If a town dweller arrange for him to be taken in at a country house or at the seaside.

2. He should not be alone but should have the benefit of congenial socieiy. Young people in a house are a decided advantage and the influence of female companionship in the case of a man is not to be neglected.

3. He should be encouraged to take exercise and to find some occupation or hobby to occupy his thoughts. As much time as possibly should be passed in the open air. Walking, driving, riding, lawn-tennis, billiards, and digging potatoes, all have their uses.

4. The cooking should be good and above all varied. You will never cure a man of any-hing unless you feed him well and properly. Stimulants should be given at meals but are not admissible in the intervals. Tobacco smoking in moderation often proves beneficial.

5. A dose of half a drachm of bromide of sodium may be given at bedtime.

6. The dose of opium should be reduced

gradually and never rapidly. Let the treatment extend over a period of a month or six weeks. If necessary reduce the quantity of opium without the patient's knowledge and take care that he has not a private supply of his own. Give tonics such as quinine, hydrochloric acid, strychnine, capsicum and gentian before meals.

APPENDIX.

NEW REGULATION RESPECTING THE SALE OF CARBOLIC ACID.

A recent Privy Council Order although having no direct bearing on "What to Do in Cases of Poisoning" is not without interest. It is dated July 26, 1900, and enacts that liquid preparation of carbolic acid and its homologues containing more than three per cent. of these substances are to be deemed poisons within the meaning of the Pharmacy Act 1868, and are to be included in the second part of Schedule A. An exception is made in the case of preparations used as sheep-washes or for any other purpose connected with agriculture or horticulture provided that they are contained in a closed vessel labelled "Poisons" with the name and address of the seller and an intimation of the agricultural or horticultural purpose for which they are intended.

The practical effect of this is that carbolic acid and preparations containing more than three per cent. of this substance or of any of its homologues, can now, with the above mentioned exception, be sold only by registered persons, and that the vessel must be distinctly labelled (1) with the name of the article, (2) with the word "poison," and (3) with the name and address of the seller.

It is also worth noting that all liniments, embrocations, and lotions containing a poison must be sent out in bottles rendered distinguishable by touch from ordinary bottles, and must bear a notification that the contents are not to be taken internally.

THE OATHS ACT.

By the Oaths Act 1888 (51 and 52 Vic., c. 46, s. 5) it is enacted that "If any person to whom an oath is administered desires to swear with uplifted hand, in the form and manner in which an oath is usually administered in Scotland, he shall be permitted so to do, and the oath shall be administered to him in such form and manner without further question."

The witness takes the oath standing with the bare right hand uplifted above the head.

The following is the formula:—" I swear by Almighty God that I will speak the whole truth and nothing but the truth."

The presiding judge should say the words and the witness should repeat them after him.

The words " So help me God " which occur in the English form are not employed and there is no kissing of the book.

The Scotch form constitutes an oath and is not merely an affirmation.

The judge has no right to ask if you object on religious grounds or to put any question.

He is bound by the provisions of the Act. The enactment applies not only to all forms of the witness-oath, whether in civil or criminal courts, or before coroners, but to every oath which may be lawfully administered either in Great Britain or Ireland.

It will be seen that no witness on being sworn can be compelled to "kiss the book."

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MURRELL'S POISONS

WHAT TO DO IN CASES OF POISONING

MURRELL

NINTH EDITION